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October 1995 • ISSUE NO. 82

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- **Bandsaw**

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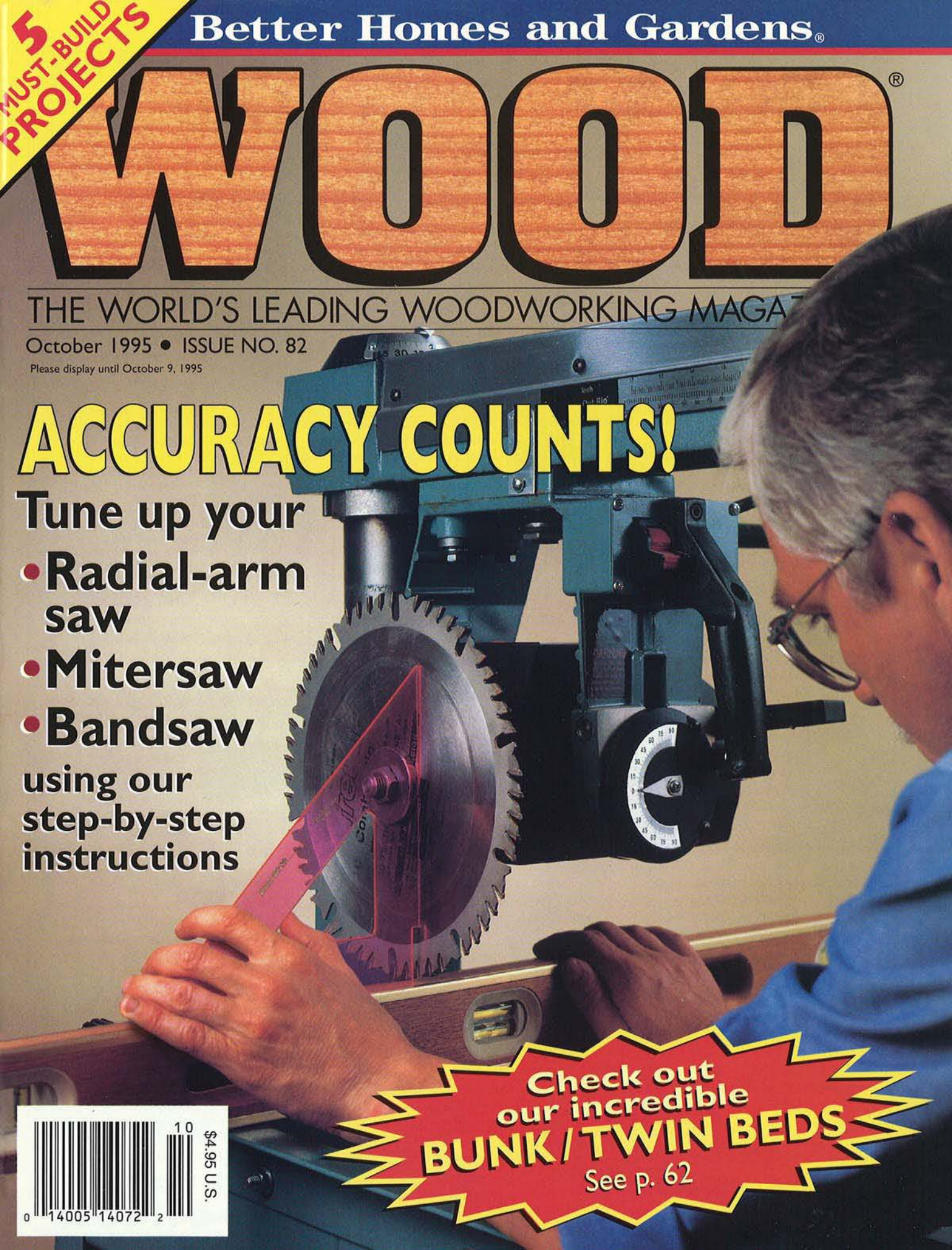

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See p. 62

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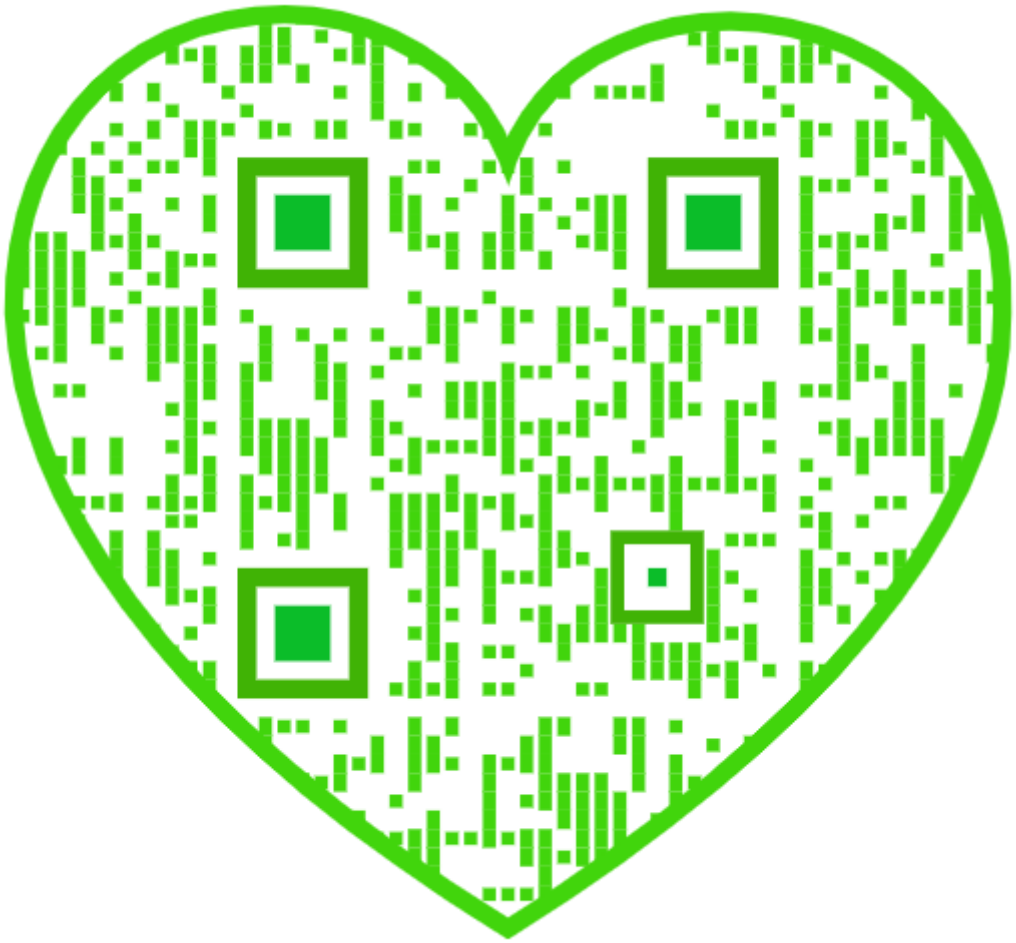

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THE EDITOR'S ANGLE

A LITTLE BIT ABOUT A LOT OF THINGS

Steve Sawyer wins the Pampered-Pooch Contest

Yes folks, it's official. WOOD® magazine reader Steve Sawyer of Arkansas City, Kansas, with a lot of help from Cupid, his two-year-old dog, beat out 294 other entrants in our Pampered-Pooch Contest. (That's Steve and Cupid talking woodworking *at right.*) For his efforts, Steve won the doghouse project we featured in the August issue and a year's supply of dogfood.

Thanks to everyone who entered. A special thanks to Joshua Gardner, from Mountain Lake, Minnesota, a gradeschooler who sent us his school picture and another photo of his Pound Puppy stuffed dog. Joshua writes, "This is the only dog I've ever owned, and it came in a box. I've been bugging my dad to get a dog, and I think if I can prove that I can get a doghouse and a year's supply of dogfood, he might get me one." Good luck, Joshua.

Now here's a dog that earns her keep.

Don't Miss Our Special Tool-Tuneup Section

If it has been a while since you've given your shop tools a tuneup, you'll want to spend some time reading this article, which starts on *page 68*. We talk in depth about radial-arm saws, bandsaws, and miter-saws, and give other, more-general tool-tuning advice, too.

New Safety Column Debuts

Every woodworker knows instinctively that danger lurks in the workshop. Yet, most of us give surprisingly little thought to tool safety and safe woodworking practice—until an accident happens or almost happens.

That's why we're introducing a new column entitled "Where Safety Begins." We've made arrangements with Mike Gililland, the owner of a safety-consulting firm and a lifelong woodworker with 25 years of engineering experience, to answer any safety-related questions you may have. See *page 84* for how to get in touch with The Safety Man.

Important Change for the 1996 Build-A-Toy® Contest

If you're planning to enter a toy in the 1996 Build-A-Toy Contest—and I hope you are—see *page 36* for the rules. You'll notice that the entry deadline is September 1, 1996. That means you have almost an entire year to plan, design, and build your toy—several months longer than in the past.

For some inspiration, take a look at the winning toys for 1995 on *pages 34-35.*

Photograph: Rex Flottman

Print this article

Larry Clayton

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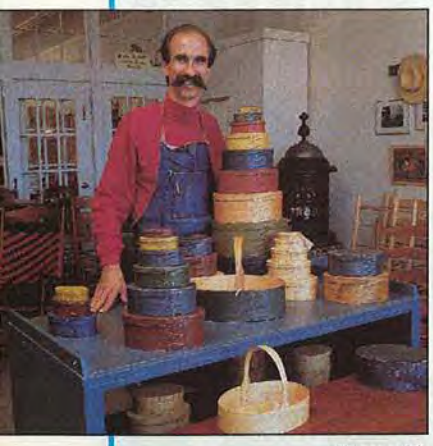
ISSUE NO. 82 OCTOBER 1995

CONTENTS



Page 43

43 A maker of Shaker
Meet Kentucky's oval-box expert.

48 Floor-model jewelry cabinet
Please a loved one with this showy organizer for necklaces, bracelets, earrings, and rings.

54 Fairest of them all
Top a dresser with this pivoting-mirror project.

56 Make 'n' shake
Spice up your table with our seasoning shakers.

58 Clowning around
Tickle a funny bone carving these two jokers.

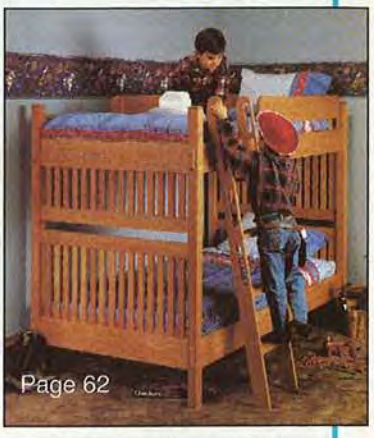
62 Two of a kind
Choose between our twin beds and bunk beds.

68 Tuning up your power tools
Learn how to diagnose problems and improve the accuracy of three major workshop tools with our tried-and-true guide.

70 Radial-arm saws
74 Bandsaws
79 Mitersaws

84 What your owner's manual can do for you
Take the time to study your power tools.

Page 58



Page 62

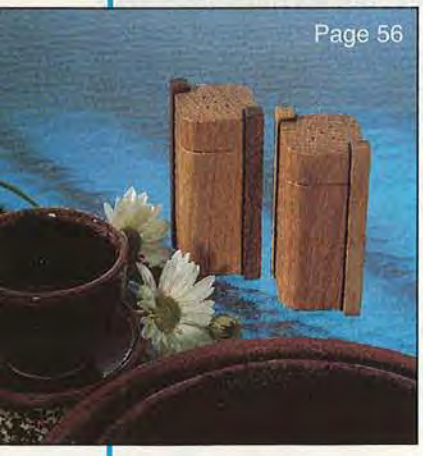
Page 48 and page 54

SHORT-SUBJECT FEATURES

1 The Editor's Angle
4 Tool Buyer's Update
6 Talking Back
10 Tips From Your Shop (And Ours)
18 What Woodworkers Need To Know
22 Products That Perform
28 Ask *WOOD*
34 Build-A-Toy™ Contest Winners
41 Wood Anecdote
104 Finishing Touches

Page 70

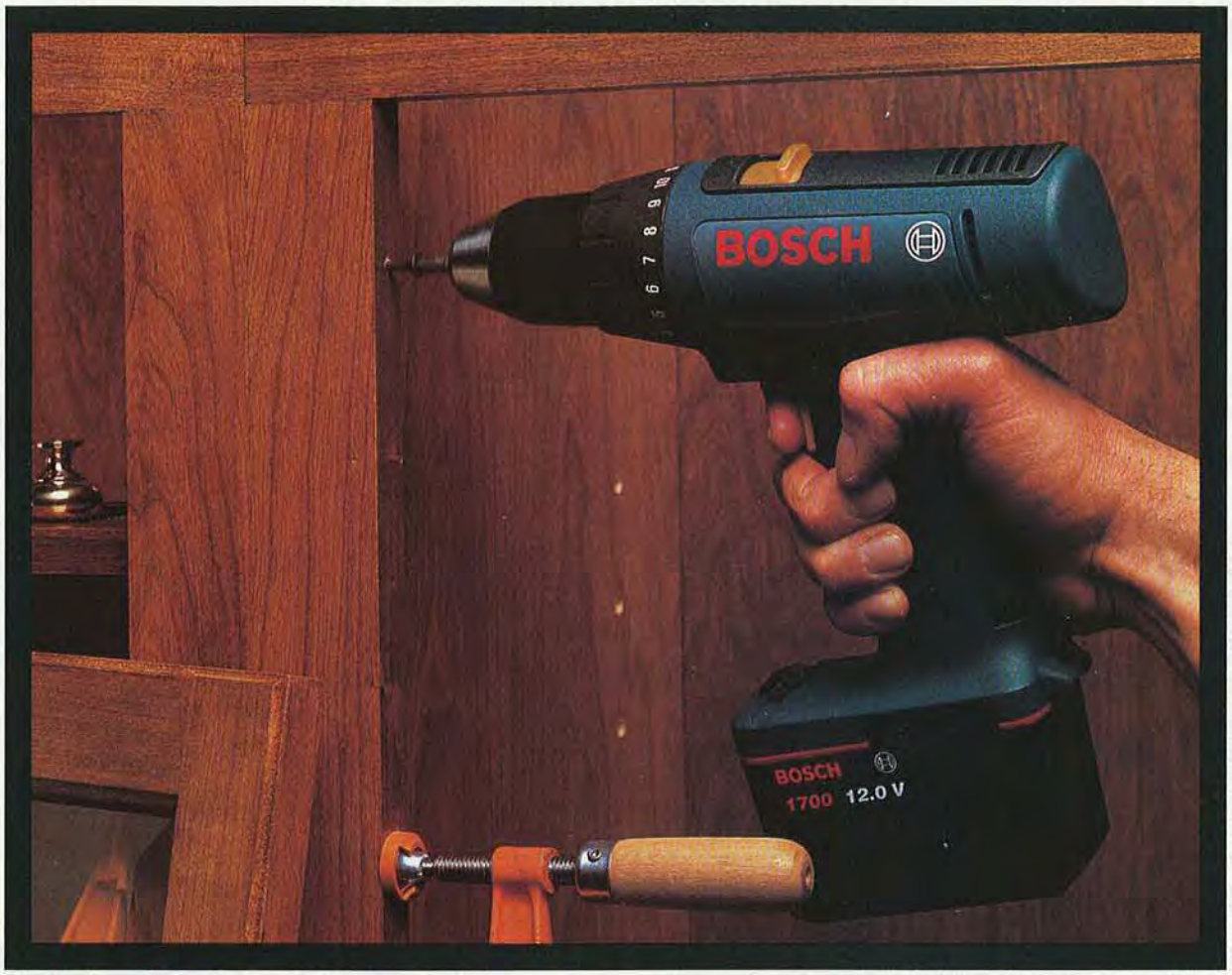
Page 74



Page 56

Page 79

This issue's cover wood grain: Tamarack



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TOOL BUYER'S UPDATE

A comfortable-to-hold detail sander at a reasonable price

Detail sanders can save you hours of aggravating work by aggressively sanding in hard-to-reach nooks and crannies. But until this Skil model 7200 Corner/Detail Sander arrived, smooth performance came at a price of $75 and up. (See our review of the other detail sanders in the November 1994 issue.)

Although comparably priced with the $45 Ryobi DS 1000 we reviewed, the new Skil 7200 Corner/Detail Sander doesn't suffer from the aggravating vibration we experienced with the Ryobi. Plus, the Skil borrows many of the same design features found in the $75 Bosch B7000 sander. These include a tool-less system for changing the triangular sanding pads, a dust-collection port, and a flexible-shaft drive system that provides equal stock removal over the entire surface of the sanding disc.

In terms of the grip, I found the Skil preferable to the Bosch because it offers a slimmer cross-section that's easier to hold. What the Skil Corner/Detail Sander lacks is the aggressive stock removal of the Bosch sander. To keep costs down, the company uses a less-powerful motor, which at top speed draws .5 amp (compared to 1.1 amps for the Bosch). But most home woodworkers don't need the kind of power the Bosch provides and should find the performance of the Skil more than sufficient for occasional work.

—Tested by Dave Henderson

PRODUCT SCORECARD

Skil model 7200 Corner/Detail Sander

Performance	★ ★ ★ ☆ ☆
Price	About $45.00
Value	★ ★ ★ ★ ★

Write to: S-B Power Tool Co., 4300 W. Peterson Ave., Chicago, IL 60646. Call 312/286-7330.

Pad brakes boost convenience of random-orbit sanders

Porter-Cable recently updated the Quicksand line of random-orbit sanders to include pad brakes. And for those of you who own the older versions of these machines, the company also offers a conversion kit so you don't have to go out and buy a brand-new sander.

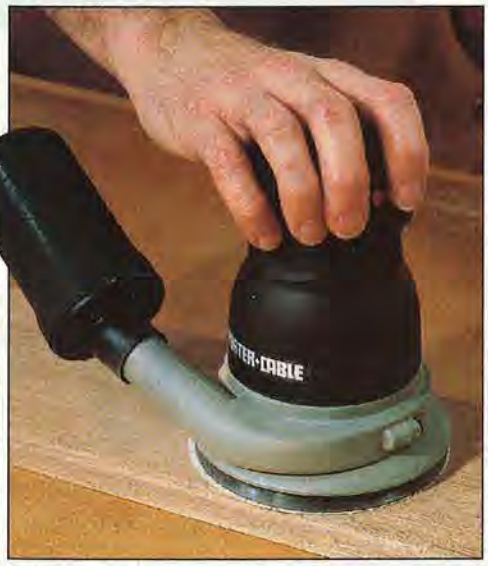
On random-orbit sanders, a pad brake prevents the sanding pad from accelerating to full motor speed when you lift the sander off the workpiece. With the brakeless model sanders, you have to turn the tool off and wait for the sanding pad to stop before placing it on a new work surface. Otherwise, the rapidly spinning pad would gouge the wood.

Except for the addition of the pad brakes, nothing about these sanders has changed from the previous models. The Quicksand line offers 5" pads in hook-and-loop or pressure-sensitive-adhesive (PSA) discs, 1.7-amp motors, and a top speed of 12,000 orbits per minute. A porous plastic canister hooked up to a port on the side of the sander traps about 75 percent of the dust generated by sanding.

The sander I tried, model 333, worked as advertised. Not having to wait for the pad to slow down and stop significantly reduces the amount of time I spend sanding small workpieces.

The pad-brake conversion kit costs about $13, and you can buy one from a Porter-Cable service center. Check in the Yellow Pages of your telephone directory for a service center in your area. If you don't find one, call the toll-free number *right*, and operators will put you in touch with a service center. The cost of installation will vary depending on what the service center charges for labor, but the process takes less than an hour.

—Tested by Tom Jackson



PRODUCT SCORECARD

Porter-Cable Quicksand Sanders

Performance	★ ★ ★ ★ ☆
Price	About $80.00
Value	★ ★ ★ ★ ☆

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TALKING BACK

We welcome comments, criticisms, suggestions, and even compliments. Send your correspondence to: Talking Back, *Better Homes and Gardens*® *WOOD*® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. To contact us via computer, use these on-line addresses: *CompuServe* address: 74404,3516 Internet: 74404.3516@compuserve.com

A rule for tape-measure adjustment

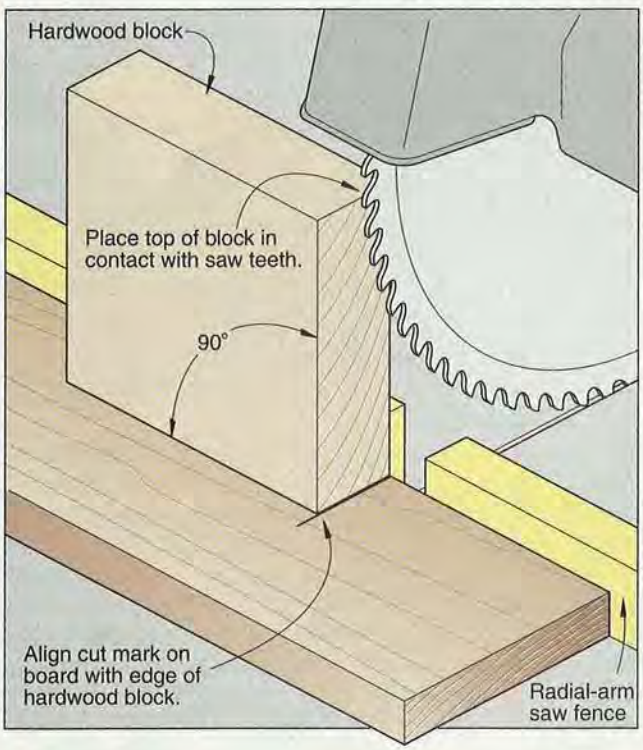
I enjoyed the article "Measuring and Marking Rules to Live By" in the February 1995 issue. I have an additional tip along this line. I have found a way of adjusting the end clip on my tape measure after it has been bent from dropping or being hit. I will lay out some marks on a board, 6" and 12" in from one end. I ensure an accurate measurement by placing the 6" mark on the edge of the board, and marking the board from the 12" and 18" marks with a fine pencil. Then, I place the end clip of the tape on the end of the board, and compare how the 6" and 12" marks line up with the marks from the previous measurement. And finally, depending on the adjustment needed, I use a pliers to bend the tape clip in or out.

—Jay L. Van Epps, North Creek, N.Y.

Still more on accurate marking

I read the article "Measuring and Marking Rules to Live By" in the February 1995 issue, and would like to add my trick to the list. I keep a block of square-cut hardwood near my radial-arm saw to assist in checking my cutting position. First, I place my workpiece against the fence of the saw. Then, I place the squared end of the block against the side of the sawblade (with the saw turned off), and on top of the workpiece. By aligning the cut-off mark on my workpiece with the edge of the wood block, I make perfect cuts every time.

—Robert Barr, Mandan, N.D.

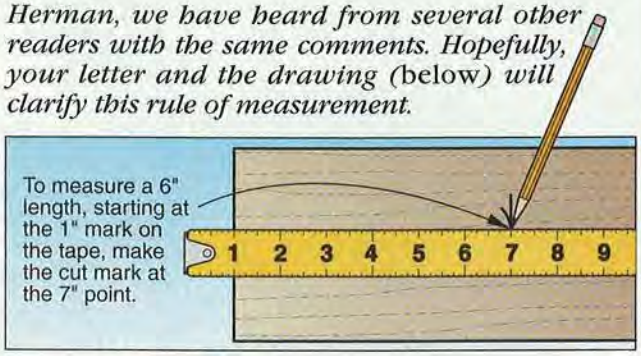

Hardwood block
Place top of block in contact with saw teeth.
90°
Align cut mark on board with edge of hardwood block.
Radial-arm saw fence

Add, don't subtract!

In the article "Measuring and Marking Rules to Live By" in the February 1995 issue, I believe that the way Rule #3 is written may contribute to some inaccuracy. To get the proper measurement when starting to measure from the 1" mark on a tape, I add 1" to the desired board length.

—Herman Barkwood, Landing, N.J.

*Herman, we have heard from several other readers with the same comments. Hopefully, your letter and the drawing (*below*) will clarify this rule of measurement.*



Memories of wheel-making

The story "Hitch Wagons from the Heartland" in the April 1995 issue evoked memories of my boyhood when I watched and sometimes hindered our small town blacksmith as he shod horses, sharpened plowshares, and repaired wagon wheels.

An important part of the blacksmith's business was tightening the metal rims of wheels that had worked loose. Our local smith used a tool called a tire shrinker for this job. He would measure the inside of the tire and the outside of the wheel with a traveler. Then, he would make two reference marks on the rim, several inches apart. The rim was then heated to forging heat between the marks. When placed in the tire shrinker, the steel was gathered where it had been heated. A little forging with the hammer then smoothed out any irregularities in the rim. Finally, a measurement was taken from the reference marks to see if the rim had shrunk enough to fit tightly.

—David Ayres, Lakeland, Fla.

I have occasionally felt a twinge of jealousy watching a blacksmith adjusting the length of a steel piece or filling gaps and spaces with a judicious use of a hammer and heat. Unfortunately, these techniques don't work very well on the wooden pieces I cut to the wrong length!

—Don Mostrom, Correspondence Writer

Continued on page 8

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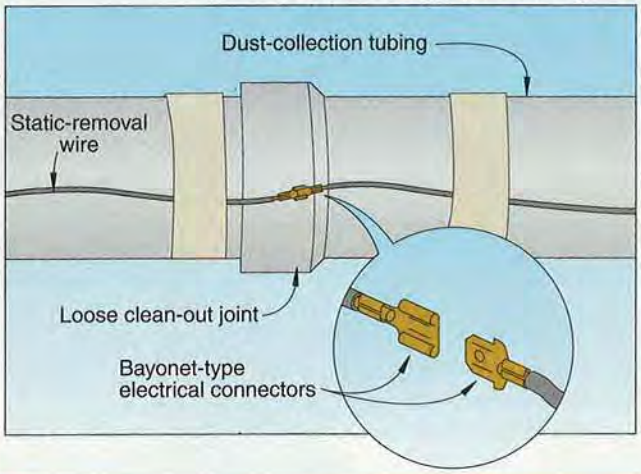
TALKING BACK

Continued from page 6

It's a snap!

I added an improvement to the dust collector static-electricity removal system that was explained in the December 1994 Talking Back, "Removing static from the outside". I placed bayonet-type electrical connectors in the wire at each pipe joint, making for an easier separation of the tubes when cleaning. Just pull the connector apart, and separate the tubes at the joint.

Monte W. Aldefer, Farmland, Ind.



Better stickers make better stacks

After reading the solar kiln piece in the June 1994 issue, I have a few more additions on the use of stickers while drying wood.

1 The stickers should be placed directly over each other in the stack. Otherwise, the stresses introduced by the offset stickers can result in some marvelous curves in the boards when the pile is unstacked.

2 The stickers should be dry and preferably of the same stock. A green sticker against green wood provides an excellent location for stain- and decay-causing fungi to grow.

3 A rough-sawn sticker will allow more air movement between itself and the green wood than will a planed sticker.

4 Do not use walnut, butternut, or oak for stickers. These woods will cause staining of other types of wood. The best bet for stickers is a low-resin, non-staining wood such as basswood.

—Leonard G. Lee, Veritas Tools, Inc., Ogdensburg, N.Y.

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TIPS FROM YOUR SHOP (AND OURS)

Does sanding into corners cause you an occasional problem?

Most finishing sanders do a great job until you get to a tight corner. But for $70 or so, you can buy an electric corner/detail sander that will zap those spots in seconds. But much of the fun of puttering around in the shop comes from dreaming up your own no-cost solutions. For instance: Rene Stebenne's "cordless" detail sander *right*, may require a little elbow grease, but it costs next to nothing for materials.

Ideas that save money almost always make good shop tips. So the next time you get a penny-wise inspiration, put it down on paper and send it to us. If we choose your tip, we'll pay you $40, plus you'll get a shot at winning a new tool for the top tip. Just send a description of the idea and a drawing or photo to:

Tips From Your Shop (and Ours)
***WOOD*® Magazine**
1912 Grand Ave.
Des Moines, IA 50309-3379

We try to publish original shop tips, so please send your idea to only one magazine. Also note that we cannot return your submissions. Thanks, and keep those shop tips coming.

Tom Jackson

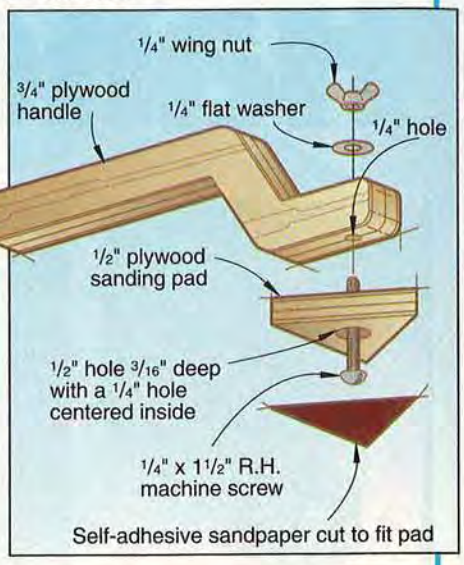
General-Interest Editor

Build your own "cordless" detail sander

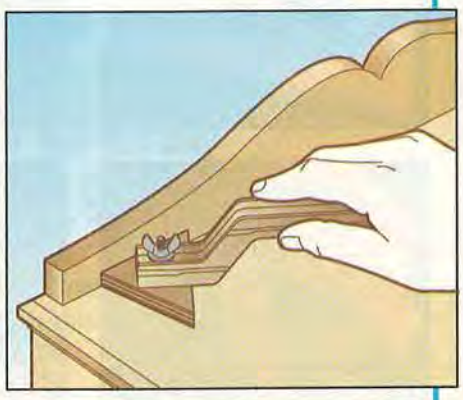
For small or occasional tight-spot sanding chores, try building this hand-powered corner/detail sander. Cut the handle from a scrap piece of ¾" hardwood plywood to the shape shown. Make the grip end long enough to fit comfortably in your hand and round the edges. Now, make the triangular pad with 2½" sides, each cut at a 60° angle. Install the pad as shown, apply a piece of self-adhesive sandpaper to the bottom of the pad, and sand away.

TOP SHOP TIP

—Rene Stebenne, Whitinsville, Mass.


¼" wing nut
¾" plywood handle
¼" flat washer
¼" hole
½" plywood sanding pad
½" hole ³⁄₁₆" deep with a ¼" hole centered inside
¼" x 1½" R.H. machine screw
Self-adhesive sandpaper cut to fit pad

For sending us the top shop tip in this issue we awarded Rene a Ryobi ML618 benchtop lathe.



Stretch film beats string for bunching materials

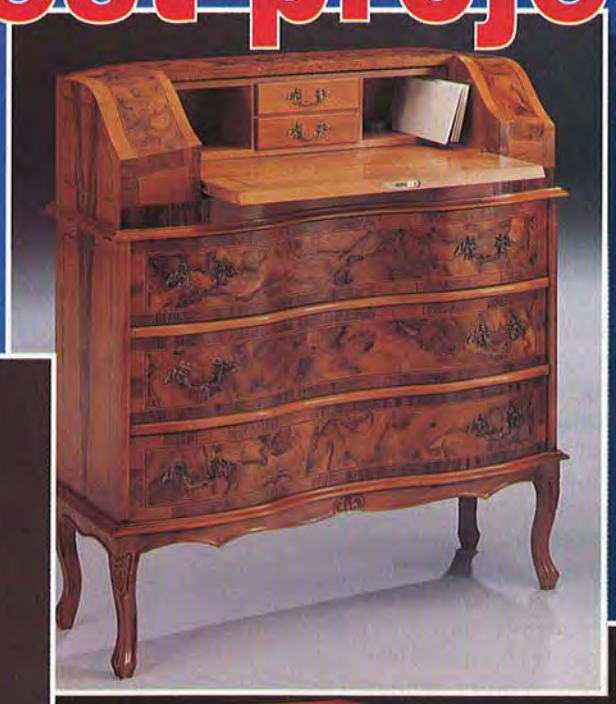
For a slip-free alternative to string or rope when tying together bunches of dowels or other long pieces of stock, try stretch film. This thin plastic material can be found in the tape section of most hardware or homecenter stores. Stretch film adheres to itself, but unlike tape, it can be reused many times. And stretch film contains no adhesives that might gum up your wood.

—W. L. Sargent, Long Beach, Calif.

Continued on page 12

Print this article

Your best projects



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15"	108	1"

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Circle No. 1321

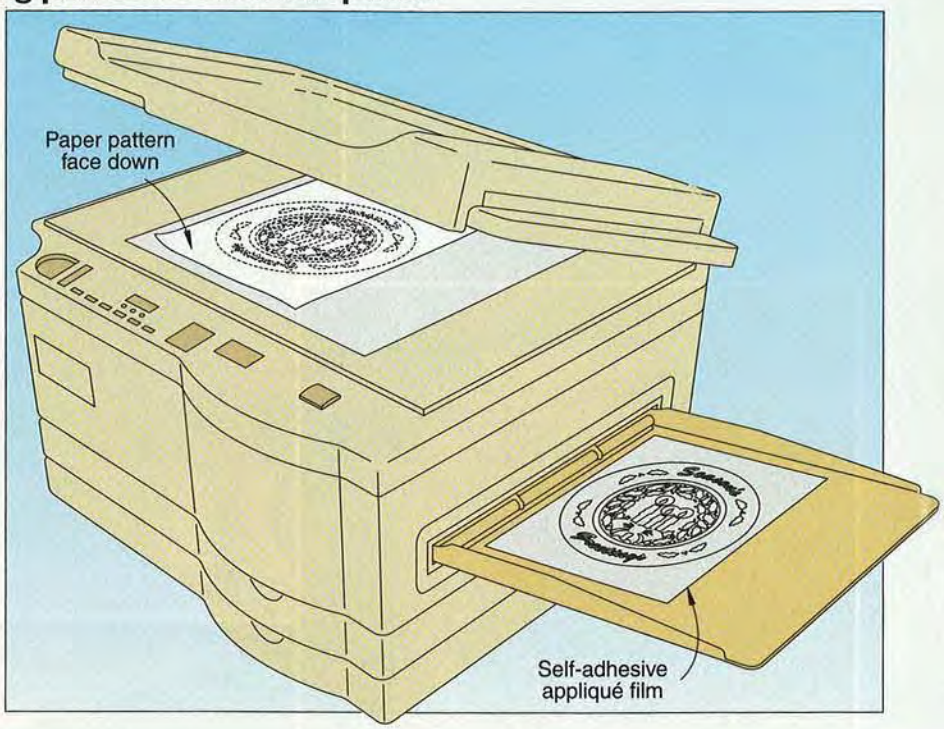
Continued from page 10

Copy scrollsaw and chip-carving patterns onto clear plastic

If you want to transfer a scrollsaw or chip-carving pattern onto a piece of wood, buy some clear acetate appliqué film. Available from office-supply stores, this film has a peel-off backing that allows you to adhere it to any workpiece. (Before you buy, check with a service technician or the company who makes your copy machine to ensure that the machine will accept clear acetate sheets.)

Now, to get your design onto the appliqué film, first draw the pattern on a piece of paper. Then, place the paper pattern face-side down on the glass plate of the copy machine, load the appliqué film in the paper-supply bin, and photocopy the pattern onto the appliqué film. Now, you're ready to adhere the appliqué pattern to your project piece.

—Phil Maass, Rochester, Minn.



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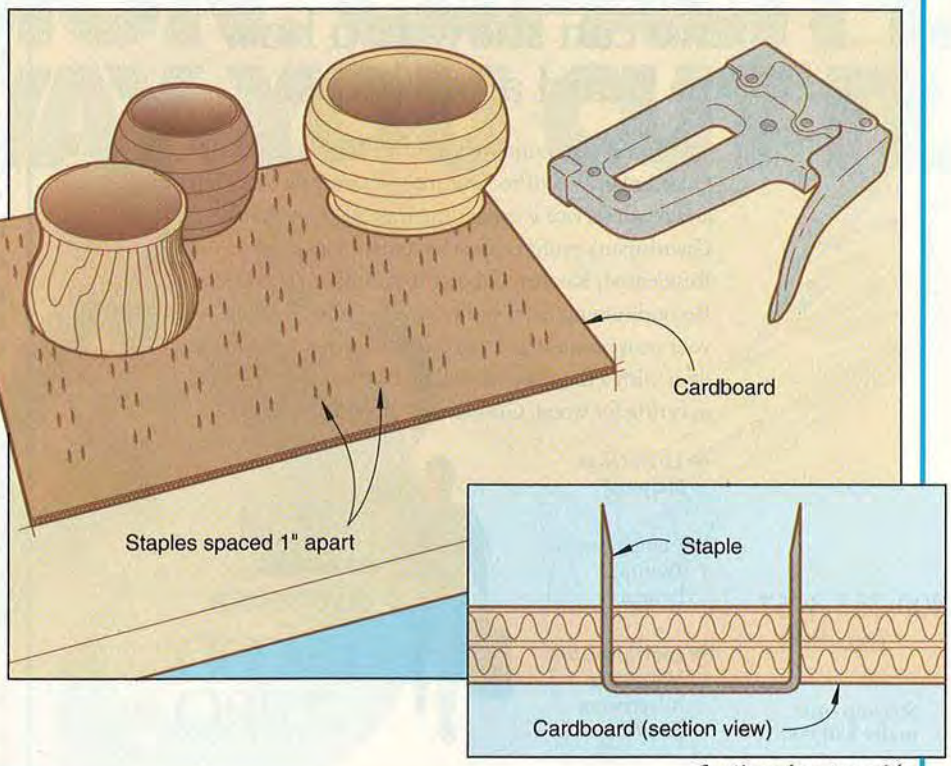
A "bed of staples" takes the torture out of finishing

Whether you spray or use a brush, finishing the bottom of a bowl, vase, or other small project always proves difficult. By elevating the project on this grid of staples, you can rotate it easily and apply the finish to the bottom edge without the project sticking to the surface it's resting on.

Start by placing a piece of ¼"-thick cardboard on top of a piece of foam rubber. Now, take a staple gun and drive several rows of ½"-long staples through the cardboard and into the foam. When you turn the cardboard over and peel off the foam rubber, you'll have a convenient, reusable bed of staples on which to place bowls, turned objects, and other small projects for finishing.

—A.V. Joyce, Stittsville, Ont.



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Circle No. 78

TIPS FROM YOUR SHOP (AND OURS)

Continued from page 13

Emery boards make great sanding sticks

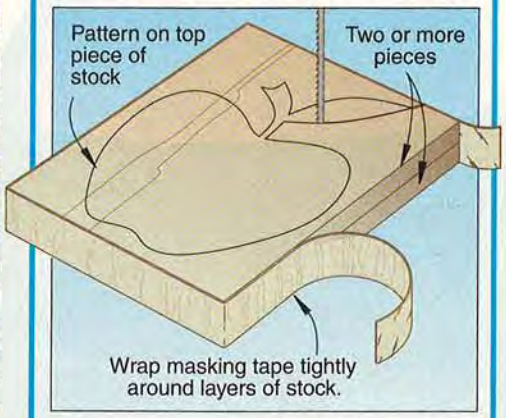
Rather than gluing small strips of sandpaper to wood, use an emery board the next time you're faced with a delicate sanding task. You'll find that emery boards are inexpensive, disposable, and come in different grits. For a permanent sanding helper, buy a metal fingernail file impregnated with diamond dust. (You can find these in the nail-care section of grocery and discount stores.)

—Verne Holmes, Redlands, Calif.

Bind scrollsaw multiples with masking tape

When you need to scrollsaw identical multiple parts, cut out the workpieces to the same length and width and bind them together with masking tape. Wrap the tape tightly around the edges, and the workpieces will remain together until you're done cutting.

—Donald Beeson, Watsonville, Calif.



Continued on page 16

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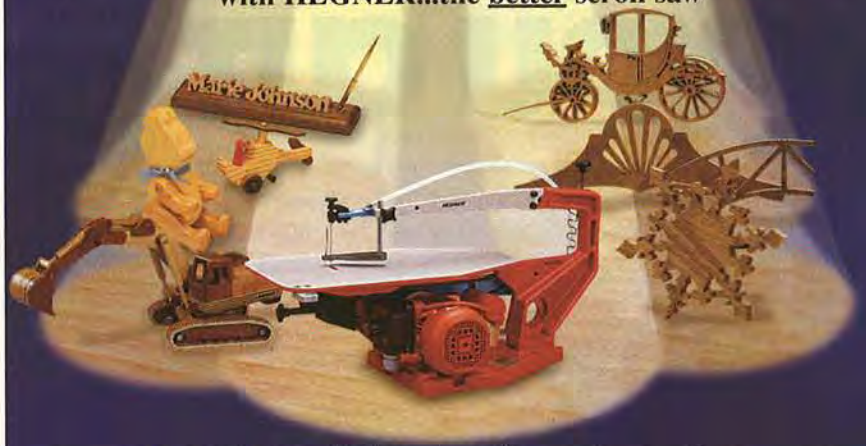

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PRIMARK

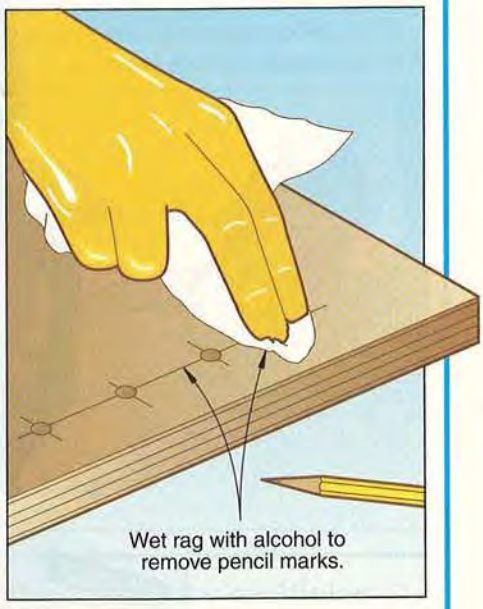
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 14

Alcohol removes pencil lines without a trace

The next time you make a pencil mark that you don't want to sand away or remove with an eraser, try alcohol. Soak the corner of a rag in denatured alcohol and rub the rag across the pencil line. The alcohol will remove the pencil mark and not leave any residue to affect the finish.

—Russell Marooney, Odessa Texas



Wet rag with alcohol to remove pencil marks.

A FEW MORE TIPS FROM OUR WOODWORKING PROS

- Learn to carve any human caricature you please by following the instructions for the clown body, starting on *page 58*. Then, instead of the clown head, carve one for a cowboy, sailor, or whatever you want.
- Ever wondered how Shaker craftsmen pin together those wrap-around oval boxes? Find out how on *page 45*.
- If you've chewed up your radial-arm saw table over the years, those saw kerfs will cause the table to warp. To keep your table warp free, check out our radial-arm saw tune-up article on *page 73*. ♣

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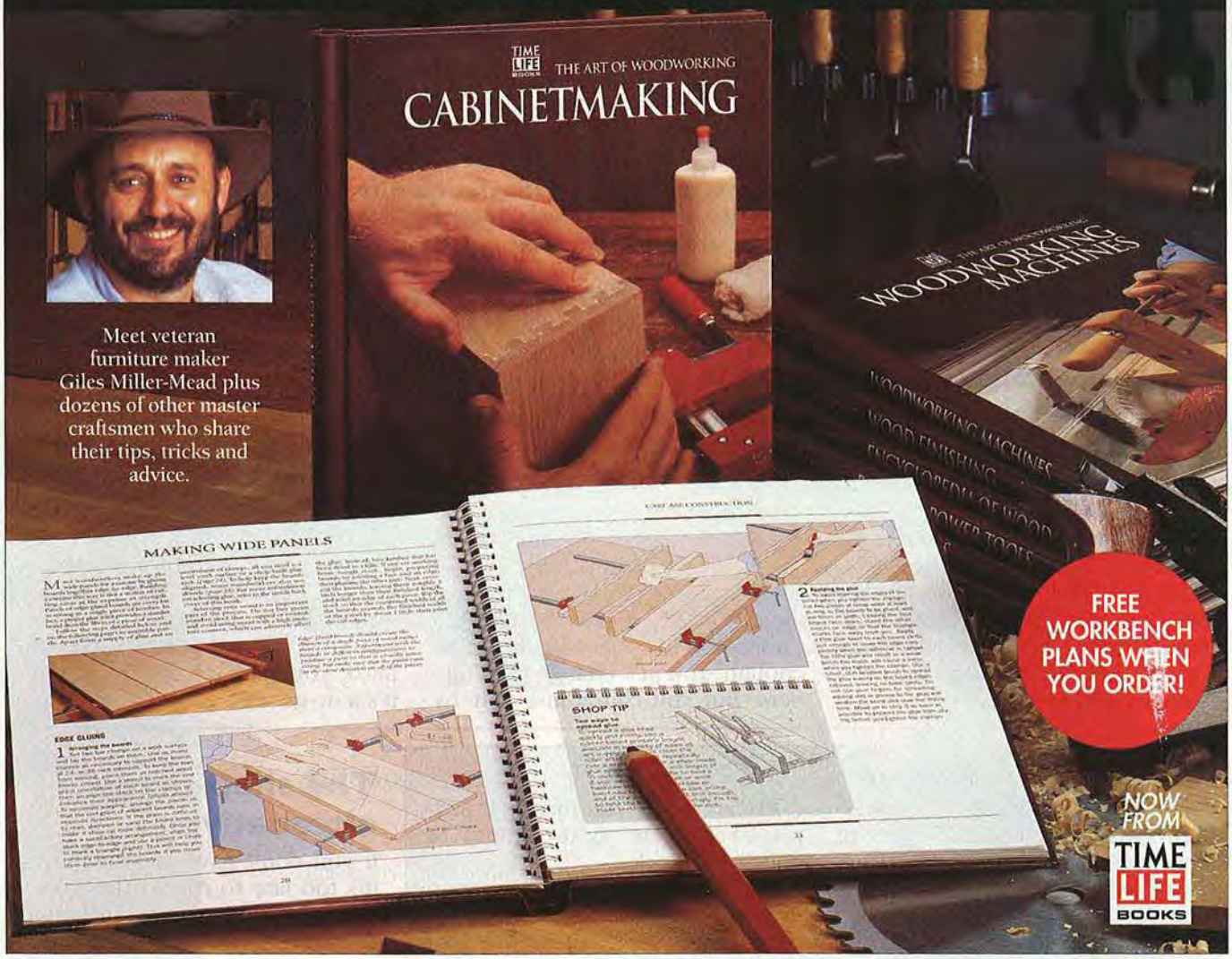

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What woodworkers need to know

Shims: the secret to making dadoes fit

For sawing dadoes, nothing beats the quality of cut you can achieve with a stackable dado set. The two outside blades cleanly cut the sides of the dado while the chippers between them clear out the channel.

To adjust the dado width with a stackable dado set, you simply slip the correct combination of chippers between the two ⅛"-kerf blades. Chippers generally come in three widths: ¼", ⅛", and 1/16". And therein lurks a potential problem.

Imagine this situation

Say you want to cut a dado to receive a part cut from ½" plywood. You set up your stackable dado set with the two outside blades (⅛" each, for a total of ¼") separated by two ⅛" chippers (another ¼"), giving a total thickness of exactly ½". You saw a test dado in scrapwood.

But when you slip the plywood into the test cut, you find it doesn't fit very well—the dado's too wide. Measurement of the plywood confirms that it isn't quite ½" thick; it's more like 15/32".

Adjusting the dado width is easy enough; you just change the chippers. But you can adjust only by 1/16" increments—the thickness of your narrowest chipper. So you decide to go 1/16" smaller by replacing one ⅛" chipper with a 1/16" one. You figure the plywood will fit, albeit snugly, into the resulting 7/16" dado. But when you make your test cut and try it out, it's a no-go. Oh, great! Now what?

Shims to the rescue

To make less-than-1/16" adjustments, you need shims. They're simply thin spacers that you place in the stack between the blades and chippers.

Your best bet is to buy metal or plastic shims made especially for dado-set use, such as the set shown *below*. They're manufactured to precise thicknesses and marked in thousandths of an inch (.001"=1/1000"). This makes it simple to add the right amount to your dado stack.

Shims of precise, known thicknesses, such as the ones in this Veritas set, make adjusting the dado width easy.

In our sample situation, you need to enlarge the dado stack from 7/16" to 15/32", an increase of 1/32". Stated in decimal form, 1/32" equals .03125". Rounded to thousandths, that's .031" or, for simplicity, .030". (A dimensional variance of .00125"—1/800"—will not be noticeable in woodworking.)

To adjust your dado stack, just pick out shims that add up to .030". The set shown contains 14 shims in four thicknesses: .002", four; .005", two; .010", four; and .020", four. Any combination that adds up to .030" would work.

Here are conversions for some fractions less than 1/16", along with rounded values you can use:

1/64"	.015625"	use .016"
1/32"	.03125"	use .030"
3/64"	.046875"	use .047"

The shop-made alternative

If you don't have dado shims and it's too late to run to the store to buy a set, make your own. Almost any thin material from notebook paper to plastic milk-jug sides will work, as shown *below*.

We cut the two plastic shims shown from 2-liter pop bottles (.010"–.011" thick); the blue cardboard one (.018") from a tool-accessory package; the paper one with printing (.007") from a magazine subscription card; and the plain paper one (.005") from the *WOOD PATTERNS*™ insert in the middle of the magazine.

Continued on page 20

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Circle No. 1367

What woodworkers need to know

Shims: the secret to making dadoes fit

Continued from page 18

Cut shims from a variety of materials so you'll have an assortment of thicknesses. (This is a great use for those magazine insert cards that irk so many of you; they're just under .007" thick.) Make each shim about 2½" in diameter with a ⅝" hole through the middle. Cut a notch as shown so you can slip the shims into the dado stack without taking it off the saw arbor. This speeds up the process.

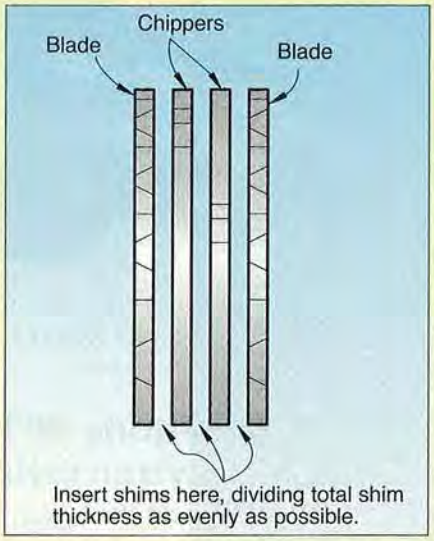
Because you may not know precisely how thick your shop-made shims are, determining how many to put in isn't quite as straightforward as with commercial sets. Here's a way to do it.

Starting with a dado that's just a skosh too narrow, measure the thickness of the part that fits into the dado and the width of the dado. Subtract the dado width (7/16" in our example) from the part dimension (15/32") to determine the shim thickness you need to add to the dado head. Then, stack up some shims and measure their thickness with a vernier caliper, adding or subtracting shims to reach the desired dimension, as shown *below*.

Measure the stacked shims accurately with a vernier caliper. When you have the required thickness, distribute the shims evenly within the dado stack.

Putting in the shims

For best results, shim more-or-less evenly throughout the stack rather than putting all the shims in one place. For our hypothetical situation—a dado stack with two chippers between the two outer blades—we could insert shims at the three places pointed out in the diagram *below*.



Insert shims here, dividing total shim thickness as evenly as possible.

Conveniently, the total shim thickness in our example divides evenly by three. So, we can just put a .010" shim in each space.

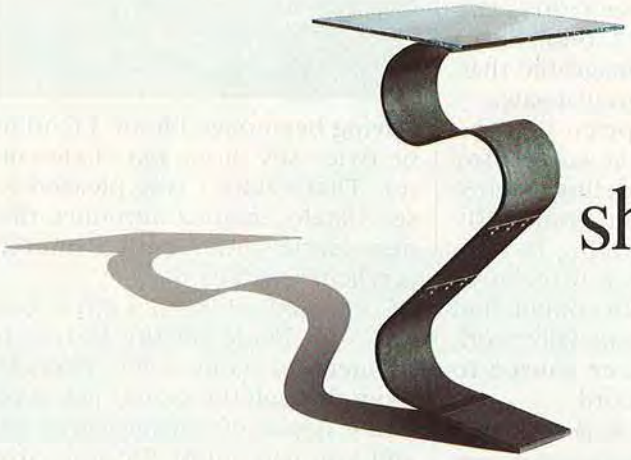
After inserting the shims, tighten the saw's arbor nut firmly. The shims act like washers between the blades and chippers—which they are. So if the nut isn't tight, the chippers may slip, causing poor cutting performance.

For best results when cutting dadoes on a tablesaw, install a throat insert with a slot barely wider than the dado stack. This zero-clearance insert helps prevent chipped edges and enhances safety by providing better support to narrow workpieces.

Photographs: John Hetherington
Illustration: Roxanne LeMoine

You can carve it,

polish it, sand it, turn it,



shape it, cut it,

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Circle No. 1120

Cordless circular saw packs a lot of punch

Years ago, when my first cordless circular saw turned out to be a dud (it had little power and a short battery life), I vowed never to use one again. But having tried the new DeWalt 14.4-volt cordless saw, I'm pleased to report it suffers from neither of those aggravating problems.

I used the DeWalt for an entire day during a deck-building project and still had cutting power left in the battery that evening. One reason this saw delivers a lot of cuts per charge is that it uses a blade with thin-kerf design. The 1/16"-wide teeth on the DeWalt blade don't have to chop out as much wood as the 1/8"- or 3/32"-wide teeth on a standard blade. The DeWalt 5 3/8"-diameter, 24-tooth blade also gives you a depth of cut that measures 1 3/4"—enough to saw through a nominal 2×4.

DeWalt sells a slightly less powerful, 12-volt version of this saw for about $220, which I did not test. And for $50 you can buy an extra battery (for either saw) so that you don't run out of power unexpectedly.

The only inconvenience I experienced with the 14.4-volt saw was that it would occasionally stall, especially when I twisted the saw slightly, or when I fed it into a workpiece too fast. Careful cutting eliminates the problem. But this tendency to stall rather than kick back (like most corded circular saws) has its advantages, too. Anyone who avoids circular saws because of the danger level will appreciate the DeWalt's kinder, gentler operation. And if you have a youngster who wants to get started with power tools, the DeWalt's light weight (6 lb., 8 oz.) will prove more manageable than your typical 12-lb. circular saw.

Given the $250 price tag, the DeWalt saw is best suited for building and remodeling professionals—people who frequently find themselves working in difficult places such as a rooftop or crawl space. You also might find it useful if you occasionally work too far from a power source to string an extension cord.

—Tested by Bob McFarlin

PRODUCT SCORECARD

DeWalt 14.4-volt cordless circular saw

Performance	★ ★ ★ ★ ☆
Price	About $250.00
Value	★ ★ ★ ☆ ☆

Write to: DeWalt Industrial Tool Co., P.O. Box 158, 626 Hanover Pike, Hampstead, MD 21074. Call 800/433-9258.

Circle cutter delivers perfect results safely

Having been once bitten, I tend to be twice shy of my old circle cutter. That's why I was pleased to see Häfele America introduce this new circle cutter with a built-in acrylic-plastic guard.

Compared with other circle cutters, the blade on the Häfele is thinner and requires less effort to plow through the wood. The maximum depth of cut measures 7/8", and you can adjust the hole size from 1 3/16" to 6 7/16". A set of four balancing weights help eliminate wobble and vibration. The result: you get smooth, effortless cutting and no tearout along the edges.

What turns this tool into a standout, however, is the plastic guard. Besides the safety advantage, the spring-tensioned guard also holds the workpiece down firmly. With this tool chucked into a portable electric drill, cutting overhead holes is almost a pleasure.

If you don't yet own a circle cutter, this is the one to buy. If you already own one, but dislike the performance or lack of safety, upgrading to the Häfele will prove to be well worth your money.

—Tested by Dave Henderson

PRODUCT SCORECARD

Häfele Circle Cutter

Performance	★ ★ ★ ★ ★
Price	About $50.00
Value	★ ★ ★ ★ ★

Write to: Häfele America, P.O. Box 4000, Archdale, NC 27263. Call 800/334-1873.

Continued on page 24

Rip Fence Technology at its Best

Craftsman's New EXACT-I-RIP Fence and 10" Table Saw

Exact-I-Rip Advantage #1: You get plenty of room to rip even your biggest work pieces–up to 24" on the left side and 30" on the right!
Deluxe miter gauge has positive stops at 90° and 45°. Includes hold down clamp for more precise crosscutting.
Thin kerf carbide-tipped blade stays sharper longer than a regular steel blade for fast, smooth cuts.
Exact-I-Rip Advantage #2: Lock the fence into place–at the front and rear–with just one lever, for consistent cutting width.
Exact-I-Rip Advantage #3: Includes additional aluminum extension to help stabilize table for really large work pieces (such as 4x8 plywood sheets).
Cast iron table and extensions dampen vibration.
The smooth-running 3 H.P. (Max. Developed) capacitor-start, capacitor-run induction motor packs plenty of punch at 120V or 240V to cut stock up to 3-3/8" thick! Notched belt drive and spring-loaded motor mount reduces belt slippage for faster cuts.
SEARS / CRAFTSMAN
Contractor Series
10"
Exact-I-Rip Advantage #4: Get pin-point accuracy in setting up your cuts, with the micro-adjust mechanism that lets you align the fence with precision.
Sawdust collection kit makes clean-up a snap.
Exact-I-Rip Advantage #5: Set-up's a breeze, thanks to the high-tech thermoplastic polymer bearing surfaces built into the Exact-I-Rip fence system. The fence always slides smoothly and easily–so you can get right to work!

Think all table saws are pretty much alike? Then you haven't checked out the Craftsman 10" Table Saw and Exact-I-Rip Fence Combo. Stock No. 29911. Together they cut the toughest jobs down to size – with an incredible new rip fence technology that gives you silky-smooth position changes, accurate cuts and a huge appetite for those large work pieces. In fact, the Exact-I-Rip fence is so terrific, we're offering it separately as a retro-fit option for other belt drive Craftsman table saws. Ask for accessory fence 29901.

CRAFTSMAN®

Only At Sears

Continued from page 22

Router pad demonstrates ample stick-to-it-tiveness

Open-mesh pads that you place under a workpiece when routing or sanding do a nice job of holding your workpiece in place and protecting it. But I was surprised to discover just how much more "grab" the new SuperPad II has over the competition.

This ability to hold the workpiece comes in handy when sanding, but I consider it essential when routing. If a workpiece slips under your router, it could ruin your workpiece or cause a dangerous kickback.

Once I placed a workpiece on the 24×48" SuperPad II though, the only way I could move it was to lift straight up. The wood didn't slip or creep despite considerable pressure. The open mesh on this pad prevents sawdust from building up on the surface, and the sawdust that does accumulate does not seem to affect the holding power of the pad. I've used several other types of pads over the years, and I'd say that SuperPad II holds workpieces better than any I've tried.

—Tested by Bob McFarlin

PRODUCT SCORECARD

SuperPad II, model 876-726

Performance	★ ★ ★ ★ ★
Price	$10.95 plus postage
Value	★ ★ ★ ★ ☆

Woodworker's Supply, 1108 North Glenn Rd., Casper, WY 82601. Call 800/645-9292. New Mexico residents add 5.82% tax, Wyoming residents add 5%, and North Carolina residents add 6%.

Continued on page 26

Grizzly IMPORTS, INC. "Importers of Fine Machinery"

NEW FOR 1995 !

Say hello to the newest members of the Grizzly family...

15" HEAVY-DUTY BANDSAW
- 3/4 H.P. TEFC Induction motor
- Includes fence & miter gauge
- Depth of cut nearly 8"
- Cam-lock door closures
- Built-in 3" dust port
- Shipping weight approx. 180 lbs.

G1148 ONLY $425.00

PORTABLE DUST COLLECTOR
- 1 H.P. motor
- 110/220V
- 17" in height
- Quick-lock bag
- Low noise output
- Includes wall brackets
- Shipping weight approx. 58 lbs.

G1163 ONLY $149.95

16" DRUM SANDER
- 1 1/2 H.P. motor
- 220V single-phase
- 1/4 H.P. belt feed motor
- Max. lumber width: 16"
- Max. board thickness: 3 1/2"
- Min. board thickness: 1/8"
- Min. board length: 9"
- Shipping weight approx. 325 lbs.

G1079 ONLY $795.00

9" HEAVY-DUTY BENCHTOP BANDSAW
- 1/2 H.P. motor
- Table tilts 15°L, 45°R
- 110V A.C. operation
- 11 1/2" x 11 1/2" cast aluminum table
- Max. cutting height: 4 1/2"
- Overall height: 29"
- Shipping weight approx. 100 lbs.

G1052 ONLY $169.95

OSCILLATING SPINDLE SANDER
- 1 H.P. motor
- 110/220V
- Spindle speed: 1720 R.P.M.
- 24" x 24" cast iron table
- Table tilts to 45° - 20°
- Shipping weight approx. 345 lbs.

G1071 ONLY $495.00

4" x 24" OSCILLATING BELT SANDER
- 1/3 H.P. motor
- Uses 4" x 24" standard sanding belts
- 1 1/2" dia. x 4 1/4" tall spindle
- Table tilts to 45°
- Quickly converts from belt sander to spindle sander
- Quick belt release lever
- Shipping weight approx. 48 lbs.

G1173 ONLY $159.95

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Circle No. 860

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Put A New Spin On Your Drill For Easier Stripping.

Paint & Rust Stripper

Finishing Sander

Also includes handy storage case (not shown)

Paint & Varnish Remover

Paint & Varnish Remover Kit

The 3M Workshop Kit Includes 4 Drill Discs:
- Medium-grade paint/varnish remover
- Fine-grade paint/varnish remover
- Large-area paint/rust stripper
- Sander/finisher
- Plus a handy storage case

For smooth finishes on metal or wood, just attach a disc to your standard electric drill!

3M Drill Discs quickly get down to the bottom of paint and varnish surfaces. Strip or sand easily—just attach a disc to your standard electric drill. No more time consuming hand-sanding and no new tools to buy. The discs protect your work, too. The Contour Surface Paint & Varnish Remover conforms to surface contours as you're working, so there's minimal gouging. And Drill Discs won't rust or splinter like wire brushes. They're strong enough to get through your big projects.

Try All 4 Discs Included In Your Workshop Kit.

For all your wood or metal stripping and sanding, the 3M Workshop Kit features 4 types of Drill Discs. You'll get a medium-grade paint/varnish remover, fine-grade paint/varnish remover, large-area paint/rust stripper, and sander/finisher. A convenient storage case holds all 4 discs. Take the edge off stripping and sanding with the smooth-finishing power of 3M Drill Discs. Order your Workshop Kit today!

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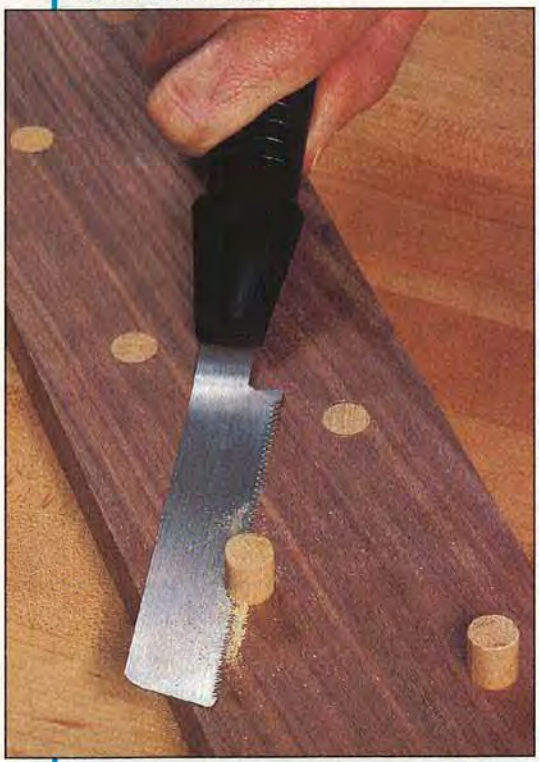
SHOP TESTED **PRODUCTS** THAT PERFORM

Continued from page 24



This saw sands flush without scratching workpieces

Dowels and face-grain plugs make nice covers for holes, but cutting and sanding the protruding dowels and plugs takes forever. This new Flush-Cutting Saw from Veritas solves that problem with teeth that are set in only one direction.

Like Japanese-style saws, the Flush-Cutting Saw features small teeth (22 per inch) and cuts on the pull stroke. And since the blade is thin and flexible, you can hold it flat against the workpiece. (Veritas also makes a double-edged version of this saw for $3 more.)

In using the saw, I found it requires a gentle touch, but with the right technique, you'll leave behind a surface that's ready for final sanding. Toward the rear of the cut, the kerf rises just a bit due to the one-sided set of the teeth. But you can knock down this small lip quickly with a few strokes of sandpaper.

I've had this saw for a few months, and find myself using it more often than I first anticipated. It works great for any task where you need to trim two small pieces of wood flush. The only similar saws I've seen cost from $17 to $20, so I'd rate the Flush-Cutting Saw as a smart buy.

—Tested by Tom Jackson

PRODUCT SCORECARD

Flush-Cutting Saw

Performance	★ ★ ★ ★ ☆
Price	$14.95 plus postage
Value	★ ★ ★ ★ ★

Veritas, 12 East River Street, Ogdensburg, NY 13669. Call 800/667-2986.

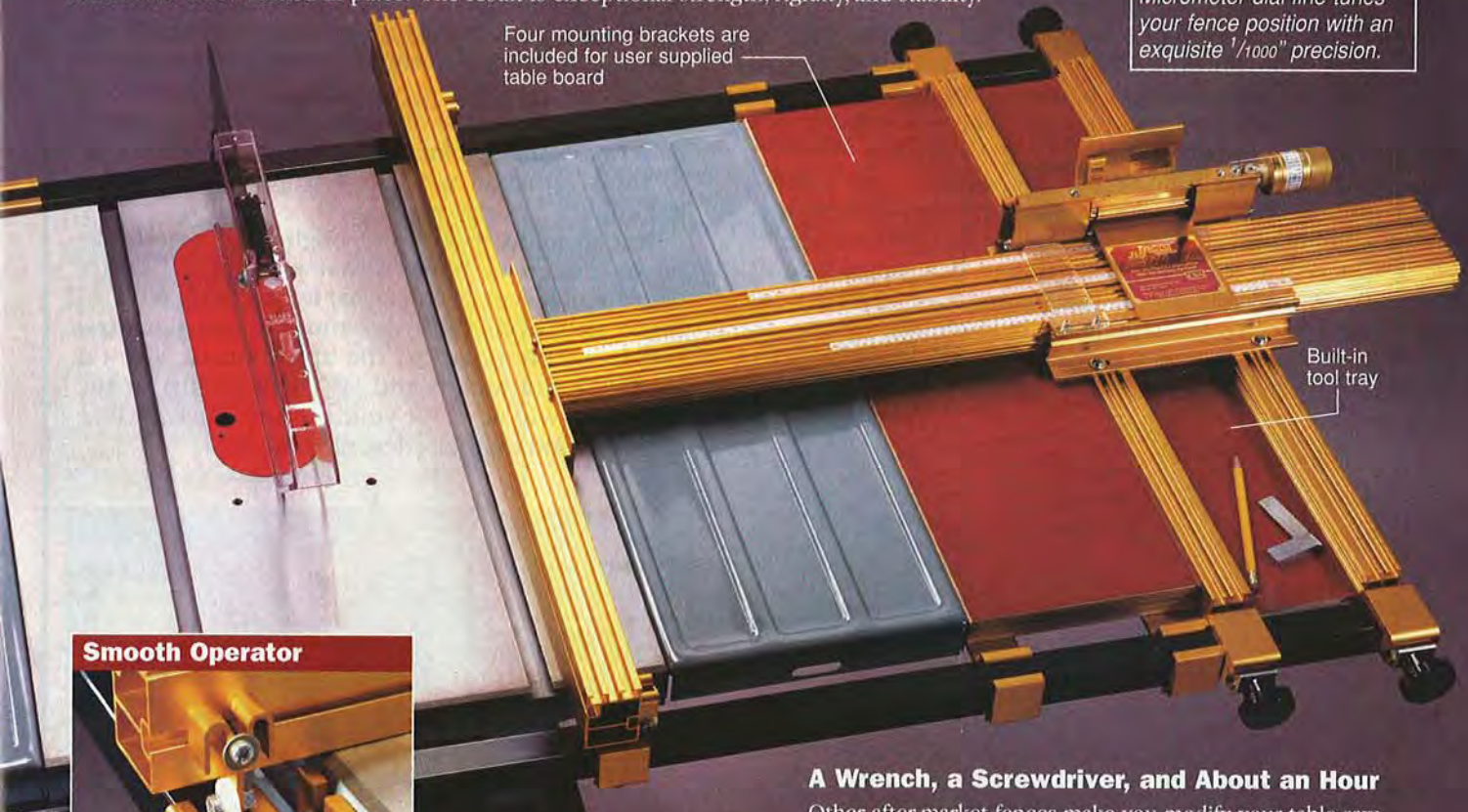
Incra® ULTRA TS
Micro Precision Table Saw Fence™

The First Real Advance in Table Saw Fence Design Since the Invention of the Table Saw Itself.

The NEW INCRA ULTRA-TS Micro Precision Table Saw Fence™ uses patented sawtooth positioning racks with ***Automatic Positioning Control™*** to locate each and every cut with true machine shop precision and perfect repeatability . . . *Instantly!* . . . *Automatically!* . . . ***EXACTLY!*** Overall accuracy is 0.004" (about the thickness of this page) with ZERO repeatability error. It's the only table saw fence that doesn't depend on a tape measure and your eyesight to position your work. And because of its structural design, centrally placed carriage, and optimized side mounted clamping system, the entire unit virtually welds itself together into one solid block of steel and aluminum when locked in place. The result is exceptional strength, rigidity, and stability.

It's Micro-Adjustable!

Micrometer dial fine-tunes your fence position with an exquisite 1/1000" precision.



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Fence skims above the table on low-friction glides. No more "clickity-clack"!

Easy On, Easy Off

Dismounts for cross-cutting operations, and remounts in less than 10 seconds.

T-Slot Fence Design

Universal T-Slots for hold downs or other fixtures on the front face and top of the fence

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A Wrench, a Screwdriver, and About an Hour

Other after-market fences make you modify your table saw to fit their design. Not so with the ULTRA-TS. INCRA's innovative universal mounting brackets virtually guarantee compatibility with any 10" table saw built in the last 50 years. And because all positioning control, alignment, and tracking functions are built right into the ULTRA-TS at the factory, there are no special requirements or critical adjustments needed to put it on your saw. That means no drilling, no tapping, and no modifications. All you need for a typical installation is a wrench, a screwdriver, and about an hour.

INCRA Precision on Both Sides of the Blade

Positioning range is 25½" to the right and 16" to the left of the blade. Accuracy is 0.004". Repeatability error is ZERO.

Turn Your Clunker into a Keeper

If you've been thinking of investing in a new table saw, think again. For just a fraction of the cost, you can rejuvenate your old clunker with the ULTRA-TS, and end up with a machine that will out-perform the most expensive table saws out there.

Best of All, You Can Afford It

For about the price of a Unifence, Excalibur, Biesemeyer, Vega, or Paralok—you get so much more with the INCRA ULTRA-TS.

ASK WOOD

Whether your woodworker's license reads "Beginner," "Intermediate," or "Advanced," you're bound to have a few questions about your favorite hobby. We can help by consulting our staff and outside experts. Send your questions to Ask *WOOD®*, *Better Homes and Gardens® WOOD* Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. *CompuServe* address: 74404,3516 (or) Internet: 74404.3516@compuserve.com

Tips on dressing rough-sawn wood

I can buy rough-sawn wood direct from a sawmill, but will need to square up the wood before I use it in a project. What is the procedure for doing this?

—Dave Gorecki, Germantown, Wis.

We recommend first using a jointer, followed by a thickness planer to dress rough-sawn wood to size and true it up. And remember that you may need to rip your rough lumber to a width that will fit your jointer. Here's the procedure:

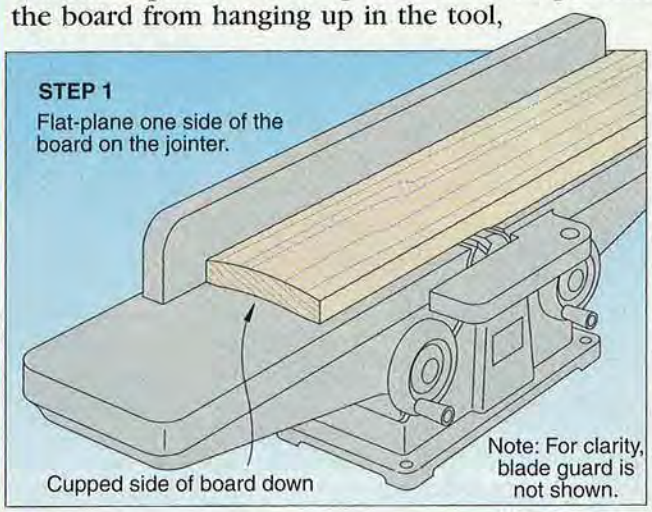
1 Flat-plane one face of the board, placing the hollow- or cupped-face down on the jointer table. Do this with several light passes of the board over the cutterhead until the planed face of the board lies flat on the jointer table.

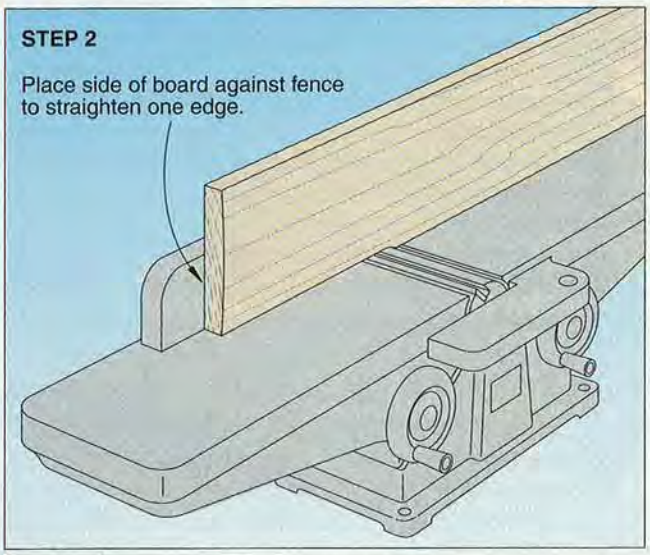
2 Place this planed surface against the jointer fence, and joint one edge of the board until it is straight and at a 90° angle to the first planed face.

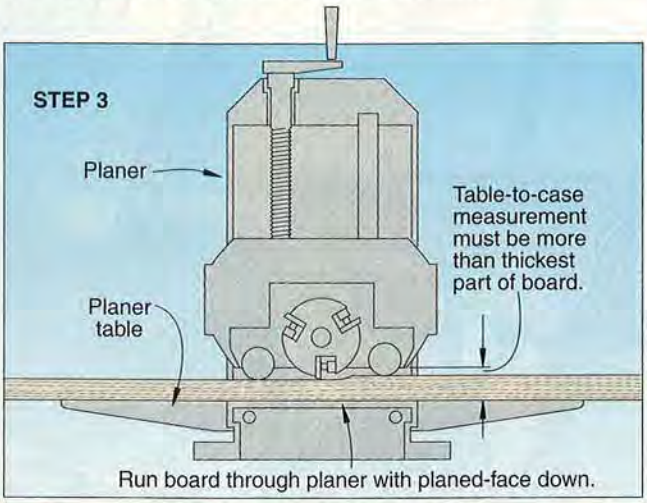
3 Use a thickness planer to cut the rough face of the board parallel to the planed face. To prevent the board from hanging up in the tool, measure the thickest portion of the board and start the thickness planing at this setting. When planing several boards, pass each board through the planer at each thickness setting so that all the finished boards are of the same final thickness.

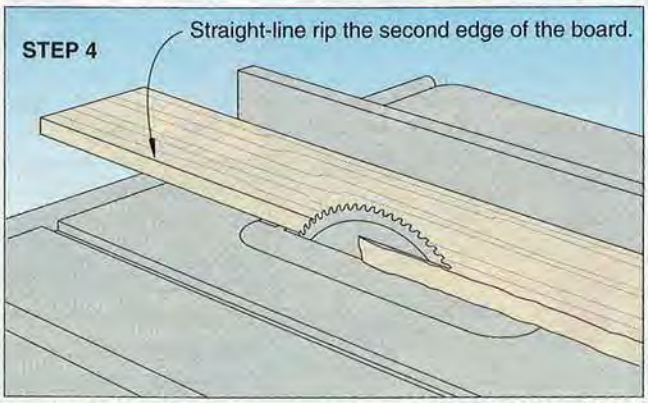
4 Take the board, now surfaced on three sides, to the tablesaw. Adjust the rip fence setting to the narrowest measurement of the board's width, or to the width you wish, and straight-line rip this last edge.

Bear in mind that some rough-sawn wood may be so curved or twisted that planing the entire board will leave little material left to work with. In these situations, we recommend that you first rough-cut the board to the approximate size (at least 1" extra length and ½" extra width) of the piece you will need for your project. Then surface the faces and edges as described above.






STEP 3
Planer
Table-to-case measurement must be more than thickest part of board.
Planer table
Run board through planer with planed-face down.



Continued on page 30

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DKH-001 Diamond Knife Hone.....$29.40

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High Speed Steel Specialty Knives Perfectly match your planer or jointer!

Item	Knives	Fits	Sale (set)
SPK-005	2	Ryobi JP155	$35.50
SPK-025	2	Ryobi AP10	$36.00
SPK-030*	2	Makita 2012 planer	$38.50
SPK-035	2	Ryobi AP12 planer	$33.60
SPK-040	2	Ryobi AH-115 & AH-125	$66.90
SPK-045	2	Makita 2030N planer	$47.00
SPK-055*	2	Delta 22-540	$33.20
SPK-060	2	Makita 2040	$57.00

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Hold a very keen edge that's ideal for hard or soft wood

(Number of knives in parenthesis)

Item #	Description	Sale
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SJK-010	6" Knives for old Delta, Craftsman (3)	$24.00
SJK-015	6-1/16" Knives for Delta DJ-15 (3)	$25.10
SJK-020	8" Knives for old Delta & Rockwell (3)	$31.80
SJK-025	8-1/16" Knives for Delta DJ-20 (3)	$32.60
SJK-030	12" Knives for Powermatic (3)	$46.10
SJK-035	12-1/2" Knives for RBI 612 & 812 (2)	$32.90
SJK-040	12-1/2" Knives for Grizzly & other (2)	$34.00
SJK-045	13-1/8" Knives for Delta RC-33 (3)	$52.10
SJK-055	15" Knives for Grizzly & other imports (3)	$58.20
SJK-065	20" Knives for Parks 20" planer (4)	$101.60
SJK-070	20" Knives for Delta 20" & others (4)	$103.30
SJK-075	20-1/2" Knives for RBI 820 (3)	$78.70

CMT's Exclusive Carbide Tipped Knives

Deliver superb performance & long life, even in plywood, particleboard and other abrasive materials

(Number of knives in parenthesis)

Item #	Description	Sale
SCK-005	4" Knives for Delta,Craftsman & other (3)	$58.90
SCK-010	6" Knives for old Delta, Craftsman (3)	$80.10
SCK-015	6-1/16" Knives for Delta DJ-15 (3)	$89.10
SCK-020	8" Knives for old Delta & Rockwell (3)	$117.00
SCK-025	8-1/16" Knives for Delta DJ-20 (3)	$118.30
SCK-030	12" Knives for Powermatic (3)	$193.60
SCK-035	12-1/2" Knives for RBI 612 & 812 (2)	$122.10
SCK-040	12-1/2" Knives for Grizzly & other (2)	$122.10
SCK-042*	12-1/2" Knives for Delta 22-540 (2)	$169.40
SCK-045	13-1/8" Knives for Delta RC-33 (3)	$181.50
SCK-055	15" Knives for Grizzly & other imports (3)	$196.90
SCK-065	20" Knives for Parks 20" planer (4)	$367.40
SCK-070	20" Knives for Delta 20" & others (4)	$416.90
SCK-075	20-1/2" Knives for RBI 820 (3)	$257.80

* Solid Carbide double-edged knives

CMT's *Award-Winning* Joint-Master™ Dado Set

With our 3/32" Ply-Groove Chipper!

- 5/8" bore
- Six Chippers: 4 @ 1/8", 1 @ 3/32", 1@ 1/16"
- 24 carbide teeth • Four-wing chippers
- Cuts grooves from 1/4" to 29/32"

108-240S 8" Anti-kickback Dado Set $179.00

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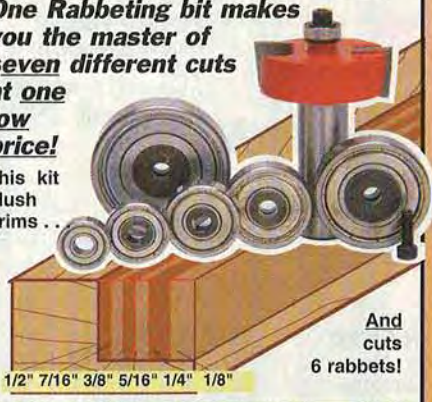
One Rabbeting bit makes you the master of seven different cuts at one low price!



This kit Flush Trims . .

And cuts 6 rabbets!

1/2" 7/16" 3/8" 5/16" 1/4" 1/8"

800-639 1/4" Shank Rabbet-Master Plus.....$38.90

800-640 1/2" Shank Rabbet-Master Plus.....$39.90

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Our 12-Piece set for Leigh's D3 Jig includes 9 Dovetail & 3 Straight Bits

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800-501 .8-Pc. 1/2" shank Set: Incra & JoinTECH .$109.90
800-611 .6-Piece Set for P•C OmniJig™.....$114.00
800-617 .5-Pc. Set for Keller 1601 Jig.....$140.70
800-618 .4-Pc. Set for Keller 2401 Jig.....$133.50

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We have adapters for almost any router: $14.90 each!

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NEW!

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with CMT's sound suppression design and master sharpener Matt Ver Steeg's remarkable tooth geometry!

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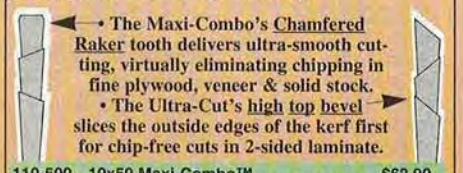

• The Maxi-Combo's Chamfered Raker tooth delivers ultra-smooth cutting, virtually eliminating chipping in fine plywood, veneer & solid stock.

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110-500 ..10x50 Maxi-Combo™.....$62.90
110-800 ...10x80 Ultra-Cut™ Laminate Blade $77.90
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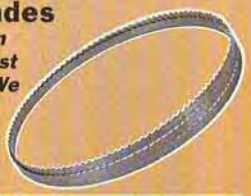

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- 2 FEED RATES: 16 & 20 F.P.M.
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- 2 SPEED: 16 & 20 F.P.M.
- 4-KNIFE CUTTERHEAD

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ASK WOOD

Continued from page 28

This board seems kinda' thin to me

I purchased 200 lineal feet of 1×6 pine trim to install in my shop. After fastening two or three boards, I mentioned to my helper that this lumber seems a bit light in weight. I checked the thickness, and discovered that the boards were only 5/8" thick. Thinking these boards should be a standard 3/4" in thickness, I contacted the lumber yard where I bought them. They checked their stack of 1×6s, and found that the whole supply was surfaced to 5/8". Is this a coming trend, or did someone make an error at the mill?

—M.K. Caudell, Burlington, Kan.

To check the standards used for sizing softwood lumber, we called Ron Peterson of the Western Wood Products Association (WWPA). Ron gave us the following information: "The WWPA, a voluntary association of sawmills, requires all member sawmills to produce lumber that meets the American Softwood Lumber Standard (ASLS). For a typical 1×6, surfaced on four sides (S4S) when dry, these guidelines call for minimum measurements of 3/4" in thickness and 5½" width. Only lumber that meets these qualifications may bear the WWPA grade stamp. Most often, only lumber rated #2 common and above will receive our grade stamp. Because many woodworkers do not want the trouble of sanding off a grade stamp, some finish-quality boards that meet our standards may not be stamped. If you are concerned about the dimensions of the wood you are buying, measure it at the lumber yard before loading." (See the chart *below* for the ASLS minimum board measurements.)

"There are sawmills in operation that do not subscribe to ours or similar wood-grading associations. By cutting their lumber a bit thinner, these mills can produce a few more boards from a log. The thinner boards can then be sold at a lower price, undercutting the mills that do follow the ASLS guidelines. Unfortunately, many people buying and using the wood don't see the difference."

"We recommend that if anyone purchases wood that seems thinner than they expected to buy, measure the lumber, and contact the lumber yard. It's not unusual for lumber yards to not be aware of the difference in thickness."

Measurements of Common Boards
(according to American Softwood Lumber Standards)

THICKNESS (inches)		FACE WIDTHS (inches)	
Nominal	Minimum Dressed	Nominal	Minimum Dressed
1	3/4	2	1 1/2
1 1/4	1	4	3 1/2
1 1/2	1 1/4	6	5 1/2
2	1 1/2	8	7 1/4
		10	9 1/4
		12	11 1/4

Continued on page 32

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IMPORTANT — FREE GIFT OFFER EXPIRES OCTOBER 31, 1995

All orders mailed by October 31, 1995, will receive a free gift, *"50 Special, Seasonal, Woodworking Patterns,"* guaranteed. Order right away!

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ASK WOOD

Continued from page 30

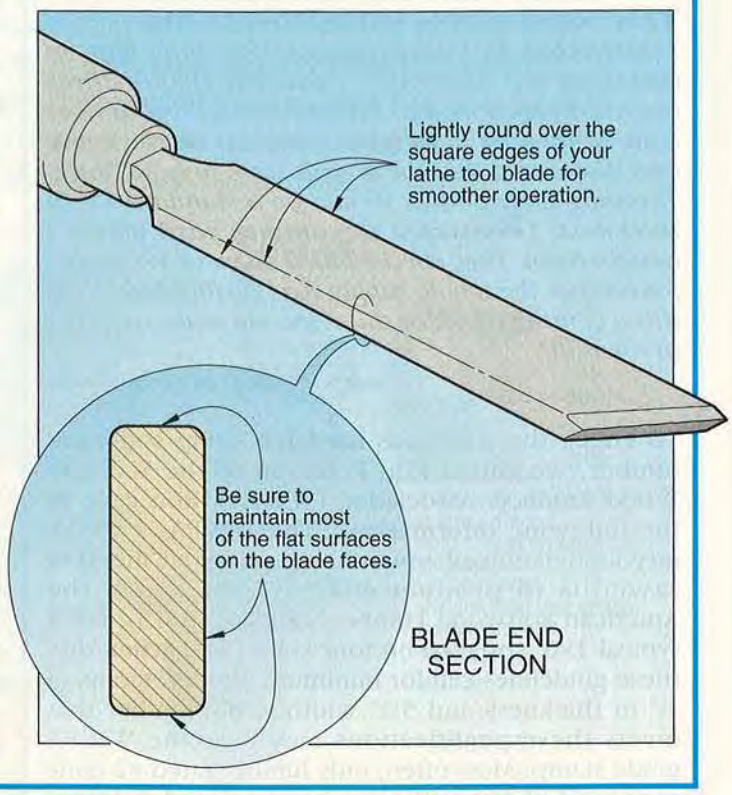
How to avoid nicks in your lathe tool rest

The cast-iron tool rest on my lathe develops nicks and dents as I work, and I find I frequently have to dress the surface with a file and stone to keep it smooth. I talked with my local dealer, and he told me cast iron is the usual material for these rests. What am I doing wrong?

—Bob Connolly, Anderson Island, Wash.

Your dealer was correct, Bob, in stating that cast iron is a common material used in making lathe tool rests. The nicks and gouges on its surface are probably the result of the corners of skew chisels and other tools with square-cornered shanks digging into the softer cast iron.

You can work around this problem by lightly rounding over the corners of these tool blades with a grinder and a stone. Grind this round-over carefully so that you don't overheat the tool blade, and then polish the rounded edge with a whetstone. The smoother you get this round-over, the easier the tool will slide along the tool rest, and the less damage it will cause to the tool rest surface. You also will find it easier to turn and roll the chisel as you are working on the lathe.


Lightly round over the square edges of your lathe tool blade for smoother operation.
Be sure to maintain most of the flat surfaces on the blade faces.
BLADE END SECTION

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BACK IN DUSTY'S SHOP...
I CAN'T WORK LIKE THIS ANYMORE (COUGH)... I WANT MY SHOP TO LOOK LIKE B.E.'S.
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1995 BUILD-A-TOY® WINNING TOP TOYS FOR 1995

What does it take to capture a prize in *WOOD®* magazine's annual Build-A-Toy® contest? Is there a single secret that guarantees success? Considering the variety of toys that came in by the February 1 deadline for the 1995 edition, as shown in the photo *below*, the answer would seem to be no. From cars to coaster wagons, puzzles to pull toys, and rocking chairs to racers, all of the entries were a joy to behold.

But take a close look at two of our prize winners. Their work just might offer an insight to prize winning. Professional woodworker Mike Jagielo of Almond, Wisconsin, again caught our judges' fancy with a captivating crab pull toy, shown in the photo *right*. A back-to-back Grand Prize winner in the pro division, Mike seems to have discovered a winning way with action toys. This year's cranky crab rolls its eyes, opens and closes its claws, and moves its legs! Talk about kid appeal. But craftsmanship counts, too, and Mike's work in cherry, walnut, maple, and zebrawood displays it in abundance.

And how about originality? Jackson, South Carolina's Jack Dalton transformed a Corsair fighter plane (shown in photo *right*) into a unique, tail-wheel-rotating riding toy certain to thrill little pilots-to-be. With its sturdy construction and flawlessly authentic paint and markings, the toy earned Jack the Grand Prize among home hobbyists.

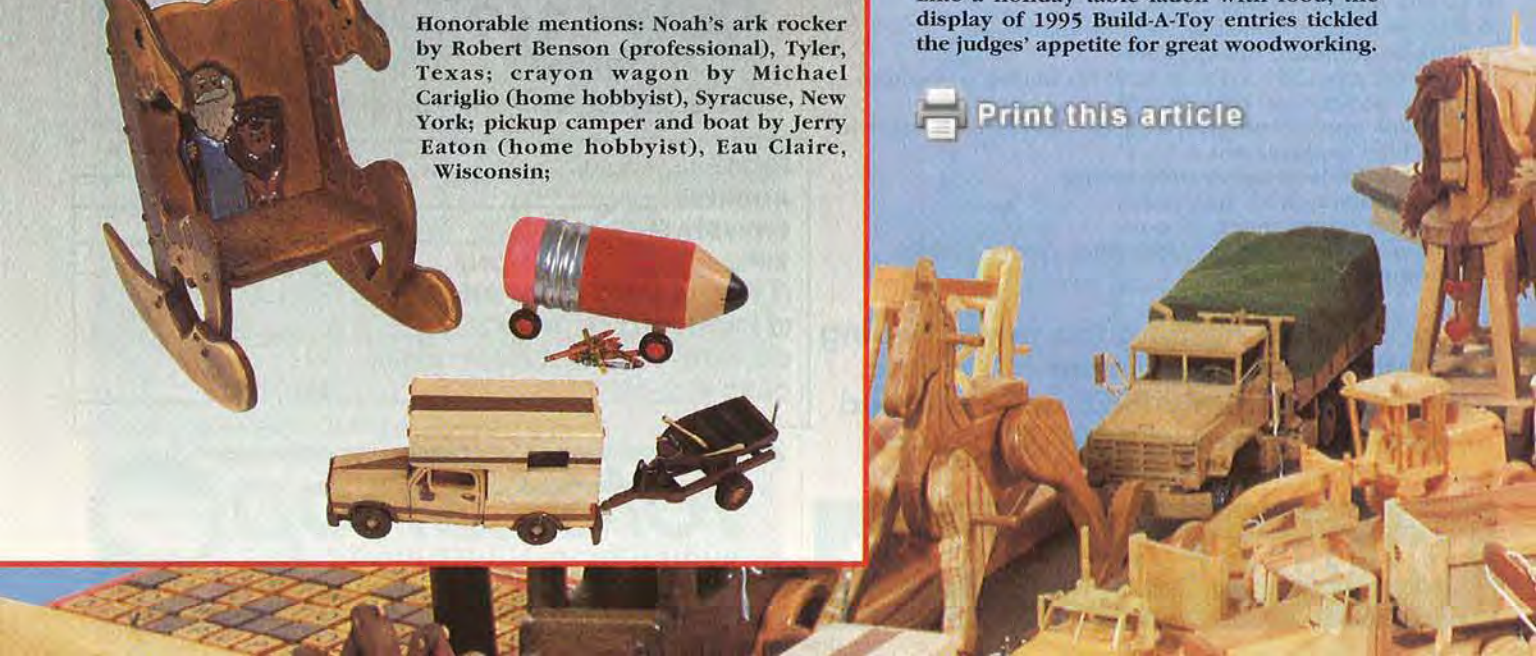
So what else do Build-A-Toy contest judges look for in picking winners? Other criteria in selecting entries for the top prizes include durability, finish, and of course, safety. For the many citations, such as Best Clear Finish, entries don't have to be original, but the other qualities generally still apply. For the complete winners' list of the nearly $18,000 in tools and merchandise, see *page 38*. And look on *page 36* for the rules and prizes pertaining to the all-new 1996 Build-A-Toy contest. Pay special attention to the deadline—for 1996 it's September 1. You'll have nearly a year to outbuild your competition instead of just a couple of months!

Toys to benefit needy kids

Ever since the 1992 Build-A-Toy contest, all toy entries have been auctioned. All of the money raised is donated to the U. S. Marine Corps Reserve to purchase many more new toys for underprivileged children through their Toys for Tots program. Including the $17,000 worth of toys from last year's Crafted for Joy toy auction, over the last few years more than $70,000 in toys have been given to needy kids at Christmas!

For 1996, this aspect of the contest remains unchanged. Come next November, all 1996 Build-A-Toy entries will go on display in Des Moines for several days prior to the auction. Then, before Thanksgiving, they'll be sold to the highest bidders. Entrants

Honorable mentions: Noah's ark rocker by Robert Benson (professional), Tyler, Texas; crayon wagon by Michael Cariglio (home hobbyist), Syracuse, New York; pickup camper and boat by Jerry Eaton (home hobbyist), Eau Claire, Wisconsin;



Like a holiday table laden with food, the display of 1995 Build-A-Toy entries tickled the judges' appetite for great woodworking.

Print this article

WAYS

Taking the citation award for Best Doll Accessory in the Home Hobbyist Division was this oak doll cradle handsomely crafted by woodworker Martha Dawson of Squaw Valley, California.

The home hobbyists' top toys: Grand Prize, Corsair airplane riding toy by Jack Dalton, Jackson, South Carolina; First Place, maple semi truck and flatbed by Frank Risso, Paso Robles, California; Second Place, oak-and-walnut wagon by George Rome, Louisville, Kentucky; Third Place, military six-by truck by William Sullivan, Weymouth, Massachusetts.

The professional division's top toys: Grand Prize, crab pull toy by Mike Jagielo, Almond, Wisconsin; First Place, action train by Robert Trace, Toledo, Ohio; Second Place, jingle pull toy by Neil Seely, Rochester, New York; Third Place, Dodge truck, antique car, and trailer by Art Bartelme, Fort Pierce, Florida.

whose toys sell for $100 or more will be notified with a personalized certificate suitable for framing. Top-money raisers will be announced in *WOOD* magazine (see *page 38*).

So a hearty thanks to all of you who entered the 1995 Build-A-Toy contest and contributed to Toys for Tots. Thanks, also, to our wonderful prize sponsors who make this great program possible. And the best of luck to those of you whose Build-A-Toy entries will make 1996 the biggest and best contest ever!

Continued on page 38

Photographs:
Doug Hetherington

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Enter *WOOD*® magazine's 8th Annual Build-A-Toy® Contest

to benefit Toys for Tots

Over $23,000 in tools and supplies to win!

All entries from the 1996 Build-A-Toy contest will be sold at a public auction in November 1996, and the funds raised donated to the U.S. Marine Corps Reserve's Toys for Tots program to purchase new toys for needy children at Christmas. All Build-A-Toy contest entrants receive a colorful, "I Crafted a Toy for Joy" sticker.

Toys will be judged on Originality, Durability, Craftsmanship, Kid Appeal, Safety, and Finish. Only toys of original design will be eligible for Best Toy Entry, and Grand through Third prize in the Home Hobbyist and Professional divisions. Toys built from plans as well as those of original design will be eligible for all prizes in the Junior Craftsman division (ages 19 and younger) and all citation awards. The special award Best Toy from a Woodworking Club will be presented to the most outstanding single toy submitted by a woodworking club in the Home Hobbyist or Professional division. The special award Best Entry from a Shop Class will be presented to the most outstanding entry (a multiple entry also qualifies) submitted by a shop class (elementary through high school) in the Junior Craftsman division. Deadline for entries is September 1, 1996. Judging will take place in mid-September and winners will be notified by mail by mid-October. Names of winners will be published in *WOOD* magazine's September 1997 issue.

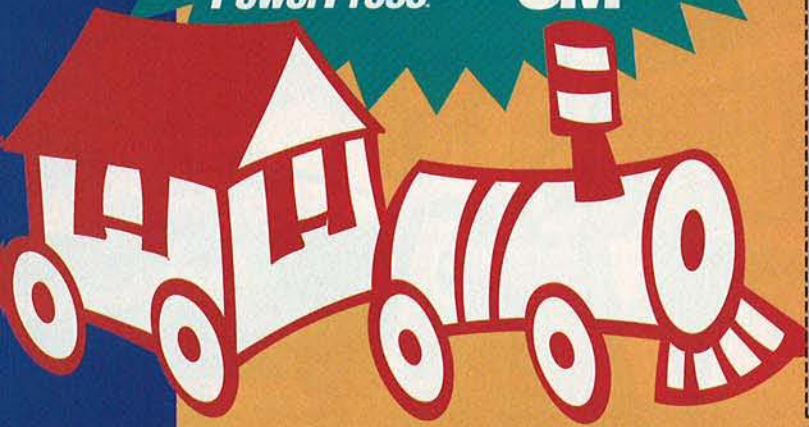
Enter a Toy and You're Automatically Entered in Our Drawing!

When you enter a toy in the contest, you're automatically entered in a drawing to receive one of these great prizes:

- **Power Press pipe clamp spreader from American Tool**
- **3M™ Woodworker's Packet** — 3M™ 2" Sanding/Finishing Kit, 3M™ Aluminum Oxide Sandpaper, 3M™ Synthetic Steel Wool, 3M™ Sanding & Fiberglass Insulation Respirator, Scotch™ Painters' Masking Tape
- **WOOD Plan from *WOOD* magazine**

No toy necessary to enter. See Drawing Rules for full details.

PowerPress 3M



WOOD® magazine's 1996 BUILD-A-TOY® Competition

Please limit entries to 25 toys per individual or group.
Please provide the following information for each entry submitted.

Division entering: ❑ Junior Craftsman ❑ Professional ❑ Home Hobbyist
My entry is: ❑ Original design* ❑ Built from plans
Check affiliation if applicable: ❑ Shop Class ❑ Woodworking Club

*For Original Design entries: I certify that I have designed and built this toy myself. Should my entry win, I agree to cooperate with *WOOD* magazine to supply builder's notes and a bill of materials for publication.

Signature _____ Date _____

Name _____

Address _____

City _____

State _____ ZIP _____

Phone (_____) _____

Send toys to: 1996 BUILD-A-TOY, *WOOD* magazine, 1912 Grand Avenue, Des Moines, IA 50309-3379. **1996 BUILD-A-TOY ENTRY DEADLINE: SEPTEMBER 1, 1996**

Home Hobbyists • Junior Craftsmen • Profes

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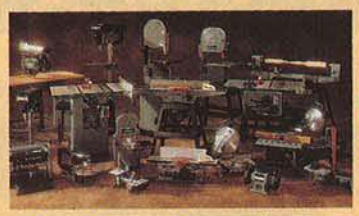
1996 Build-A-Toy Contest Prizes



Best Toy Entry
$3,000 in Delta tools
(Original design only, all divisions)

Junior Craftsman
(19 yrs. and younger, all designs)

Grand Prize
$1,500
RBI Hawk Ultra
20" scrollsaw

First Prize
$1,000 in
Skil tools

Second Prize
$750 in
Dremel tools

Third Prize
$500 in
Meisel Hardware
merchandise

Home Hobbyist
(original designs only)

Grand Prize
$2,100 in Craftsman stationary machines
(Sears Craftsman 29911 tablesaw, 24834 bandsaw, 21317 drill press, 22590 spindle sander, 29978 sawdust collector)

First Prize
Grizzly tablesaw, jointer, planer, and bandsaw valued at $2,000

Second Prize
$1,000 in
Bosch tools

Third Prize
$500 in
Dremel tools

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(original designs only)

Grand Prize
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DeWalt tools

First Prize
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multimachine

Second Prize
$1,000 in
Bosch tools

Third Prize
$500 in
Porter-Cable
tools

Citations (All designs, all divisions eligible)

Best Use of Wood, $575 Milwaukee compound miter saw
Best Model, $250 in Formby's finishing supplies
Best Clear Finish, $250 in Formby's finishing supplies
Best Painted, Dyed Finish, $200 in Red Devil paints
Best Educational Toy, $250 in Craft Supplies merchandise
Best Action Toy, $250 in Woodworker's Store merchandise
Best Pull Toy, $250 in Klockit merchandise

Special Awards

Best Toy from a Woodworking Club (one toy per club): $250 in Leichtung merchandise, $200 in American Tool clamps, $200 in Red Devil paints

Best Entry/Shop Class (no limit on number of toys per class entry): $250 in Delta tools, $1,000 in 3M supplies, $300 in Red Devil paints, $200 in American Tool clamps

1996 CONTEST RULES

1. Toys must fit into a box no larger than 2' x 2' x 2'. The primary material should be wood but may incorporate other materials.
2. Please follow Consumer Product Safety Commission guidelines: nontoxic wood finishes only; no parts smaller than 1 1/4" square on toys for children under three years of age; no sharp corners or points; pull strings longer than 12" should not have beads or other attachments that could tangle and form a loop.
3. Entries must be received by September 1, 1996. All entries must be postpaid; collect entries will be refused. Attach an entry label, photocopy of an entry label, or a 3½" x 5" card with entry information and your name and address to each toy.
4. Woodworkers (except Junior Craftsmen) who build toys from existing plans will be eligible for Citation prizes only. Woodworkers who build their own original designs will be eligible for all prizes.
5. Entry constitutes permission to use winner's name, hometown and photograph for promotional purposes, unless prohibited by law. Contest sponsors, employees and family members of Meredith Corporation, their affiliates and subsidiaries are ineligible. Void in Quebec.
6. Winners will be selected and notified by mail on or about October 15, 1996, and will receive the prize directly from the manufacturer/distributor. Value of prize is suggested retail price. For a list of winners, send a separate, self-addressed stamped envelope to BUILD-A-TOY, 1912 Grand Avenue, Des Moines, IA 50309-3379.
7. Meredith Corporation will donate all entries or auction money received from entries to the U.S. Marine Corps Reserve Toys for Tots program.
8. **For woodworkers who enter their toy as an original design:** Toy must be your own original design. A different approach to an existing toy would qualify. Toys based upon published patterns are not eligible.
9. A panel of representatives from the U.S. Marine Corps Reserve, Meredith Corporation, and woodworking experts will judge the toys on or about Sept. 15, 1996, on child's appeal, craftsmanship, originality, durability, safety, and finish. The panel's decision will be final.
10. Professional woodworkers include woodworking teachers and anyone earning an income by selling wooden items.
11. Winners are responsible for applicable taxes.

DRAWING RULES

1. NO PURCHASE OR CONTEST ENTRY NECESSARY.
2. To enter, fill out the Official Entry Form or place this information on a 3½" x 5 postcard. Up to 25 entries per person allowed. Persons who enter the contest are automatically entered, one entry per toy up to 25 toys.
3. Sweeps begins on September 1, 1996. Entries must be received by September 1, 1996. No responsibility is assumed for lost, late or misdirected entries.
4. Sweeps open to residents of the U.S.A., except employees of Meredith Corporation, contest sponsors, its agents, affiliates, subsidiaries and families.
5. The winners will be selected on or about October 15, 1996. Winners will be notified by mail and prize delivered on or about October 30, 1996.
6. Selection of winners by a random drawing from all entries received will be under the supervision of Meredith Corporation whose decisions are final.
7. Odds of winning depend on number of entries received.
8. Prizes are not exchangeable or transferable. Only one prize per entrant is allowed.
9. Entry constitutes permission to use winner's entry, name, hometown, likeness and photograph for editorial, public relations, promotional and advertising purposes on behalf of Meredith Corporation, unless prohibited by law. Winners will be required to sign an Affidavit of Eligibility and Release of Liability within ten (10) days of notification.
10. Subject to all federal, state and local laws and regulations. Void where prohibited. Applicable taxes are the sole responsibility of the winners.
11. For a list of prize winners (available after October 15, 1996) send a separate, self-addressed, stamped envelope to: Build-A-Toy Sweepstakes, 1912 Grand Avenue, Des Moines, Iowa 50309-3379.
12. Prizes: 25 pipe clamps (retail value $25 each), 25 woodworker's packets (retail value $25 each) and 250 WOOD Plans (retail value $9.95 each).

sionals • Shop Classes • Woodworking Clubs

1995 BUILD-A-TOY WINNERS

In *WOOD*® magazine's annual Build-A-Toy contest, everyone's really a winner because their contributions benefit needy children through Toys for Tots. But, there are great prizes, too! Here's the complete list of winners (you can see the top finishers' toys on *page 34*).

Californian Sherryn McNab crafted this colorful train that won Best Educational Toy in the pro division.

Home Hobbyist Division

Grand Prize. $2,000 in Grizzly stationary power tools, plus $300 in American Tool woodworking clamps. Jack Dalton, Jackson, S. C. Airplane rider.

First Place. $1,500 in Delta power tools. Frank Risso, Paso Robles, Calif. Maple semi and flatbed.

Second Place. $1,000 in Craftsman benchtop power tools. George Rome, Louisville, Ky. Oak-and-walnut coaster wagon.

Third Place. $500 in Skil power tools. William Sullivan, Weymouth, Mass. Military six-by truck.

Honorable Mention. $300 in Stanley hand tools. Michael Cariglio, Syracuse, N. Y. Crayon caddy.

Honorable Mention. $300 in Stanley hand tools. Jerry Eaton, Eau Claire, Wis. Pickup camper, boat, and trailer.

Best Use of Wood. $250 in Formby's finishing supplies. William Howe, Rolling Hills Estates, Calif. Vintage truck with shingled camper.

Best Clear Finish. Campbell Hausfeld HVLP sprayer. Jack Rowland, Porterville, Calif. Vintage car of cedar.

Best Action Toy. $250 in Dremel tools. Raymond Gillman, Livonia, Mich. Crane on wheels.

Best Painted or Dyed Finish. $250 in The Woodworkers' Store merchandise. James R. Blyth, Huntersville, N. C. Roscoe Rabbit airplane.

Best Doll Accessory. $250 in Meisel Hardware Specialties merchandise. Martha Dawson, Squaw Valley, Calif. Doll cradle.

Best Educational Toy. $250 in Dremel tools. Charles Frodl, Belmont, Mich. Train set numbers in a box.

Best Pull Toy. $250 in Dremel tools. Leo Lohman, Golden, Colo. Spider pull toy.

Best Transportation Toy. $250 in Toys and Joys merchandise. Maynard Wright, Amherst, Ohio. Semi with livestock trailer.

Dee Cook painstakingly built this amusing mobile workshop to capture Best Transportation Toy among the pro entries.

Professional Division

Grand Prize. $2,000 in Bosch power tools, $300 in American Tool woodworking clamps. Mike Jagielo, Almond, Wis. Captivating crab pull toy.

First Place. $1,500 in Delta power tools. Robert Trace, Toledo, Ohio. Brightly painted action train.

Second Place. $1,000 Hegner Multimax scrollsaw from Advanced Machinery Imports. Neil Seely, Rochester, N. Y. Jingle pull toy.

Third Place. $500 in Skil power tools. Art Bartelme, Fort Pierce, Fla. Dodge truck and trailer with vintage car.

Honorable Mention. $300 in Stanley hand tools. Robert Benson, Tyler, Texas. Noah's ark rocking chair.

Best Use of Wood. $250 in Constantine's merchandise. Hank Gorczynski, Batavia, N. Y. New York Central tugboat.

Best Clear Finish. $250 in Formby's finishing supplies. George Campbell, Owensboro, Ky. Corsair airplane.

Best Action Toy. $250 in Dremel tools. Thomas Coates, Butler, Pa. Math board game.

Best Painted or Dyed Finish. $250 in Trend-Lines merchandise. Paul Gobat, Camp Hill, Pa. Apple tree puzzle.

Best Doll Accessory. $250 in Meisel Hardware Specialties merchandise. Dee Cook, Lawrenceville, Ill. Vintage oak baking center.

Best Educational Toy. $250 in Dremel tools. Sherryn McNab, Sanger, Calif. Ten-car alphabet train set puzzle.

Best Pull Toy. $250 in Dremel tools. Mike Jagielo, Almond, Wis. Captivating crab pull toy.

Best Transportation Toy. $250 in Crafts Supplies USA merchandise. Dee Cook, Lawrenceville, Ill. Miniature mobile shop.

SPECIAL AWARDS

Best Toy from a Woodworking Club. $250 in Leichtung merchandise, Milwaukee Tool $500 miter saw, $250 in Behlen wood-finishing products. San Joaquin Fine Woodworking Assoc., Thomas Keefe, Visalia, Calif. Seahorse alphabet puzzle.

Best Toy from a Shop Class. $250 in Delta tools, $250 in 3M supplies, $250 worth of Behlen wood-finishing products. Mechanicsburg Intermediate School, William Richie instructor, Mechanicsburg, Pa. Natural-finish biplanes.

Crafted for Joy Toy Auction Top Money Raisers

Readers' 1994 Build-A-Toy entries that brought at least $100 at the Crafted for Joy toy auction held November 16, 1994 in Des Moines were notified by letter. Here are some of the toys that exceeded $100 in the bidding that raised enough for $17,000 in toys to benefit Toys for Tots:

Mike Jagielo, Almond, Wis.
Spider pull toy, $600.

James M. Kelly, Austin, Texas.
Toy train, $570.

Larry Weaver, Petersburg, W. Va..
Cased train set, $570.

Robert Elsmore, Barberton, Ohio.
Working carousel, $500.

Rodney Rahrle, Springfield, Ohio.
Snow sled, $440.

Matt Drown, Slayton, Minn.
Gambler gumball dispenser, $350.

Earl Street, Elk City, Okla.
Combine, $325.

Lavern Weinschenk, Jr., Davenport, Iowa.
Space shuttle, $270.

Ken Prill, Chippewa Falls, Wis.
Cased tea set, $270.

Wallace Leeker, LeMay, Mo.
19 biplanes, $265.

Mike Schaffner, Owatonna, Minn.
Front-end loader, $260.

Dave Taylor, San Antonio, Texas.
KID-TV camcorder, $250.

Ted Meredith, Des Moines, Iowa.
Waddle duck, $250.

Robert Benson, Tyler, Texas.
Carved boot rocker, $210.

Larry Bjork, Greeley, Colo.
Horse tricycle, $210.

Jim Christian, Vancouver, Wash.
Furnished doll house, $200.

Russell Sweet, Franklin, Ohio.
Hook-and-ladder fire truck, $200.

Ken Barkley, North Palm Beach, Fla.
School bus rider, $180.

Mark Canales, Gansevoort, N. Y.
Race car, $170.

HARBOR FREIGHT TOOLS

LOW PRICE GUARANTEE
WE'LL BEAT ANY COMPETITOR'S PRICE ON ANY IDENTICAL ITEM –EVEN IF IT'S AN ADVERTISED SPECIAL

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FOR ALL ITEMS SHOWN BELOW!

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5 SPEED BENCH DRILL PRESS

1/3 HP MOTOR

- 2" stroke, 8-1/4" swing
- 1/2" chuck

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$49.99

25 PC. BRAD POINT WOOD BIT SET

- Sizes: 1/8" through 1/2" by 64ths

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SLASHED $50

12" PLANER

Put a professional finish to low cost raw lumber quickly. Powerful smooth drive system gives cool, even planing and constant blade speed.

- Motor: 2 HP, 115V, 60 Hz
- Single wheel depth adjusts: 0" to 6"
- Maximum planing capacity: 3/32"
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CONTROLLED PRESSURE NON-MARRING HARDWOOD CLAMPS

JAW LENGTH	OPEN-JAW CAP.	ITEM	PRICE
6"	3"	06986-3VJA	$2.99
7"	4-1/2"	06987-7VJA	$3.49
8"	4-3/4"	04852-3VJA	$3.99
10"	6"	04853-4VJA	$4.99
12"	8-1/2"	04854-5VJA	$5.99

DRILL MASTER

TIN COATED FORSTNER BIT SETS

Includes 3/8" cut down shanks and individually organized wooden case. Rockwell hardness range from 55-65HRC. 20

16 PC. SET

- 16 sizes 1/4" to 2-1/8" by eighth's

ITEM 32404-8VJA
$29.99

20 PC. SET

- 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by eighth's

ITEM 31130-7VJA
$34.99

RYOBI Ryobi OSS450

BLOWOUT PRICE!

OSCILLATING SPINDLE SANDER

Nothing beats this machine for contour and curve sanding. 1/2" to 3" spindle.
120V, 3.5 amps; 45 oscillations per minute; 1680 RPM; 1/2" and 1" drum diameters; 29 lbs. tool weight

- Dust collection port
- Factory reconditioned, factory perfect

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12-1/2" ROLLER AND BRACKET SET

Double your table saw capacity! Make your own roller table.

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$4.49

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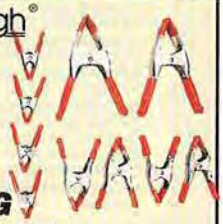
Pittsburgh LIFETIME WARRANTY



10 PC. SPRING CLAMP SET

Made of nickel-plated, heavy gauge steel, with heavy duty tempered springs and comfortable vinyl coated handles.

- Contains four 1" capacity clamps, four 2" capacity clamps, & two 3" capacity clamps

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Pittsburgh LIFETIME WARRANTY

2 PC. 3/4" HEAVY DUTY PIPE CLAMP SET

Pipe not included.

- Handle screw operating range: 2-1/8"
- Weight: 2-7/16 lbs.

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$2.99

DEWALT

3/8" 9.6V CORDLESS DRIVER DRILL KIT W/ KEYLESS CHUCK

DeWalt DW944K-2R

- 110 Watts maximum output
- 0-350/0-1200 RPM, reversible
- Includes: TWO 1000 cycle battery pack with 1 hour charger, steel case and double ended screwdriver bit
- Factory reconditioned, factory perfect

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SAVE $20

18 AND 19 GAUGE AIR FINISH NAILER

Easy to use in tight spots. With a loading capacity of 105-18 gauge brads

- Air consumption: 3.5 CFM at 75 PSI
- Uses 18 gauge brads
- Similar to Senco LS4

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PROFESSIONAL 4" BELT/6" DISC SANDER

Die cast aluminum table for disc or belt sander bevels to 45°. Versatile sander handles wood, plastic, aluminum, and steel.

- 1/3 HP, 120V • Belt: 4" x 36"; disc: 6"
- Speeds: belt 1952 ft./min.; disc 3450 RPM • Ship. wt.: 47 lbs.
- Belt table tilts 0° to 90°
- Work table: 5" x 7-1/2"

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This is the set all serious woodworkers need. Ground to ultra close tolerances for the best finish available. Includes individually organized wood storage case (shown in inset). • 1/4" shanks
Includes:1-1/4" rabbeting, 1-3/8" cove, 1-1/16" roman ogee, 1-1/4" rounding over, 1/2" flush trimming, 1-3/16" 45° chamfer,1/2" dovetail, 3/4" straight,1/2" straight, 3/8" V-groove, 1/4" combination panel, 1/4" straight, 1/2" mortising, 1/4" self-piloting flush trim, 3/16" self-piloting 7° bevel trim.

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LIMIT 1

CEN-TECH

LIMIT 1

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Multiple clutch plates permit instant adjustment. All clamps have 3/4" pads & throat depth of 2-3/4".

LENGTH	ITEM	PRICE
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12"	05975-0VJA	$3.99
24"	05976-1VJA	$4.99
36"	05977-0VJA	$5.99

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10", 2HP BENCH TABLE SAW

- Max. depth of cut @ 90°: 3"; @ 45°: 2-1/2"
- Motor: 2 HP, 115V, 60 Hz, 13 amp, 4500 RPM
- Blade sold separately

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- 40 tooth carbide tips

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GOOD ON ALL FORREST OR *OTHER MAKES* OF CARBIDE BLADES OR DADO SETS. EXPIRES 10-31-95.

Must mention *WOOD* magazine to receive coupons & extra bonus with purchase.

CHOPMASTER FOR SLIDING COMPOUNDS & MITER SAWS

New specs, 5° Neg. Pts. & flat, runs out less than .002 for perfect, tight, smooth, splinter-free miter joints.

EXTRA 10% – 20% OFF FALL SALE!

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Delta Sidekick 6-1/2"x40Tx5/8"	$149	$ 89
Sears 8-1/4" & Delta 8-1/4"x60Tx5/8"	$170	$ 99
Hitachi 8-1/2"x60Tx5/8"	$179	$109
DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	$179	$109
Delta 9"x80Tx5/8"	$204	$119
Ryobi–Makita & all 10"x80Tx5/8"	$207	$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	$229	$139
Ryobi–Makita 14"x100Tx1"	$266	$179
Hitachi 15"x100Tx1"	$277	$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

WOODWORKER I – For TABLE and RADIAL SAW

This trim and crosscut ALL PURPOSE blade gives scratch-free polished cuts on all materials RIP or CROSSCUT UP TO 2".

- ALL 60T AND 3/32" THIN KERF 30° ATB and 5° face hook on 10" diameter and under. 12" and 14" are 20° ATB 1/8"K.
- DOUBLE HARDER and 40% STRONGER carbide.
- THIN KERF: Saves 1/3 wood loss on each cut, radial or table. Feeds easy when used for moderate rip and crosscut on table saw. Reduces "JUMP IN" for better "PULL CONTROL." Practically eliminates bottom splinter on RADIAL CROSSCUT.
- Totally stops ALL bottom and top splinter on ply veneers in push-cut mode on RADIAL.
- Our STIFFENER STRONGLY RECOMMENDED AGAINST outside blade for best cuts. Made and serviced in U.S.A. for your benefit.

	LIST	SALE
14"x60Tx1" 1/8"K	$224	$159
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9"x60Tx5/8" 3/32"K	$156	$119
8"x60Tx5/8" 3/32"K	$150	$109
NEW!		
8-1/4"x60Tx5/8" 3/32"K	$150	$109
7-1/4"x60Tx5/8" 3/32"K	$150	$109

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With this one ALL PURPOSE blade you can RIP & CROSSCUT 1"–2" ROCKHARDS and SOFTWOODS resulting in a **SMOOTH AS SANDED** surface. PLY-VENEERS of OAK and BIRCH will crosscut with NO BOTTOM SPLINTER at moderate feed rates.

- DOUBLE HARD and 40% STRONGER C-4 CARBIDE
- Ends blade changing
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- Ends cutting 1/16" oversize to allow for RESURFACING
- **BUY AND SHARPEN 1 BLADE INSTEAD OF 3**

5/8" holes, boring thru 1-1/4" add $7.50. Larger at Time Basis —Shipping $4.50

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12"X40TX1"	$183	$129
12"X30TX1"	$162	$119
10"X40TX1/8" or 3/32"	$156	$119
30T 1/8" or 3/32"	$135	$ 99
9"X40T	$146	$ 99
30T	$125	$ 99
*8-1/4"X40TX 3/32"	$136	$ 99
8"X40T 3/32"	$136	$ 99
30T	$115	$ 89
7-1/4"X30T 3/32"	$112	$ 69
**6"x40T 3/32	$136	$ 89

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BUY OUR BEST SELLER 10" X 40T FOR ONLY $119 PLUS EXTRA 10%–20% OFF FOR FALL SALE!

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Outperformed 36 other premium blades, both foreign and domestic!
WOOD® Magazine test, Sept. '93, pg. 45

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FROM THE LEADER IN DADO TECHNOLOGY!

"No tearout on all five woods tested"
(INCLUDES MELAMINE)
Fine Woodworking J/A '91, page 51
"Best Value" WOOD Magazine, Oct. '91, pg. 62,63

- **NEW 3/32" CHIPPER**
  - allows twice as many groove widths to match thin plywood
- **FREE SHIMS INCLUDED**
- **NO SPLINTERING**
  - when cross-cutting oak, ply-veneers, and **melamine**
- **PERFECT FLAT BOTTOM GROOVES**
  - not staggered steps or round-bottoms like a wobble-dado leaves
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  - rip, cross-cut, miter any depth
- **CUTS ALL SIZED GROOVES**
  - 1/8" through 29/32" in 1/32" increments
- **SUPER-HARD CARBIDE**
  - gives up to 300% longer life, especially good on plywoods and abrasive particle boards

Dado FOR AS LOW AS $184 *(YOUR NET COST AFTER USING SHARPENING COUPONS)*

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C-4 Carbide Tips — 24 on each saw blade — twice as many as most competitors!

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6" D. 5/8" Bore **NEW**	$299	$269	$242	$229
8" D. 5/8" Bore	$321	$289	$260	$245
10" D. 5/8" & 1" Bore	$389	$349	$314	$297
12" D. 1" Bore	$499	$449	$404	$382

(Bore up to 1-1/4" Add $25 — Plus $5.50 S&H)

DURALINE HI-A/T FOR TABLE & RADIAL SAWS ALL FLAT FACE

5/8" HOLES. Boring up to 1-1/4" $7.50 extra. Larger holes–time basis. Shipping $4.50.

Faster feed rates & absolute splinter control. Stops splintering on OAK/BIRCH PLY VENEERS & MELAMINE.

SIZES AVAILABLE	LIST	SALE
7-1/4"x60Tx3/32" K	$149	$129
8"x80Tx1/8" & 3/32" K	$202	$169
9"x80Tx1/8" & 3/32" K	$207	$179
10"x80Tx1/8" & 3/32" K	$207	$159
12"x80Tx1-1/8"K	$212	$181

SIZES AVAILABLE	LIST	SALE
12"x100Tx1-1/8"K	$253	$215
14"x80Tx1"	$232	$197
14"x100Tx1"	$266	$226
16"x80Tx1"	$262	$223
16"x100Tx1"	$294	$243

Above 1" bore standard.

SPECIAL FALL SALE EXTRA 10%-20% OFF

CARBIDE IS THE HARDEST OF THE C-4 GRADES AND 40% STRONGER, NOT WEAKER!
FOR 50% TO 300% LONGER LIFE.

Standard C-2 Carbide (below, left) and FORREST **still sharp** Oxidation and Corrosion Resistant Sub-Micron C-4 Carbide (below, right). Each shown after cutting 3,500 feet of MDF. Similar results obtained cutting particle board, melamine, and plywood.

STILL SHARP AFTER 3,500 FEET OF CUTTING!

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FOR BETTER CUTS on all brands of blades, use our large 1/8" DAMPENERS-STIFFENERS against one side.

- **Parallel and flat to .001**
- **Stop vibration, flutter, cutting noise, and blade ring**
- **Tryable and returnable for full cash refund.**

4"	$21
5"	$24
6"	$25

7" AND LARGER AVAILABLE
FULL RANGE OF OTHER INDUSTRIAL SIZES
REDUCES NOISE 50%–75%

WE RECOMMEND OUR FACTORY SHARPENING as some local sharpening creates problems with **MICRO-CHIPPED EDGES** reducing blade life & cutting quality.
3-5 DAYS ON THESE AND ALL MAKES OF FLAT FACE & CONCAVE CARBIDE TIP SAWS. Ship via UPS. Typical 10x40T $15.00, 60T $17.75. Add return UPS $5.00, $1.00 each additional blade.

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Circle No. 1322

WOOD ANECDOTE

Print this article

FLOWERING DOGWOOD

Its beautiful blooms belie the toughness of its wood

Buyers looking for hard stock to make weaving shuttles had to buy dogwood by the cord.

When the flowering dogwood (*Cornus florida*) blooms in the spring, the sight can take your breath away. The clusters of petals against the little tree's dark branches make it stand out in the deepest woodland. Throughout its range in the southeastern states, the tree adds to any landscape.

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This tough-as-nails reputation also made it (even today) a valuable commodity in the textile industry. You see, until the 1860s, the mechanical looms in New England and Europe relied on smooth, long-wearing boxwood from Mediterranean countries for their shuttles (spindle-shaped devices for carrying thread). In that same period, though, roller skating became a popular European pastime, and boxwood became the choice for the wheels. This new demand on a limited boxwood supply resulted in the substitution of dogwood.

Indeed, dogwood became such a valuable commodity that it was sold, not by the volume in a log as other commercial wood, but by the cord! That's partly because the dogwood at best only reaches 40' tall and grows dispersed among other trees, not in stands. So, it couldn't be economically logged in volume. Instead, farmers made extra money selling a stack at a time.

Illustration: Jim Stevenson

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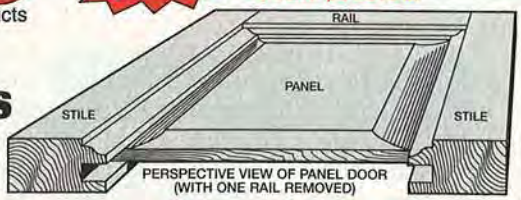

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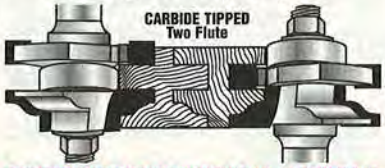

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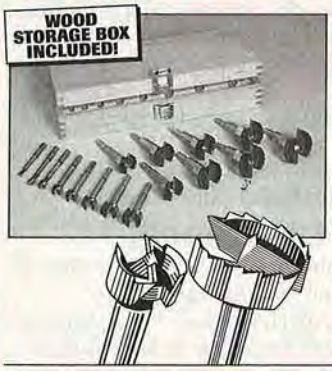

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A MAKER OF SHAKER

Berea, Kentucky, woodworker Charles Harvey excels at traditional oval boxes, but his real love is the Shaker chair.

Following dryfitting, Charles assembles the chair parts in a giant vise.

The Shakers were good business people," says Charles Harvey from his perch on a handcrafted cherry blanket chest. He's about to explain the most obvious contents of his shop—oval nesting boxes and Shaker-inspired chairs. "Both oval boxes and chairs, in production, lend themselves to economy of scale. That is, they don't require a lot of material. There's a lot of labor, but not much lumber. For instance, there's only about eight board feet of wood in a side chair."

According to Charles, who has studied the work of the Shakers extensively, these two items represent the most well-known of their products. That's mainly because boxes and chairs were produced in quantity, and were so well crafted that many original examples still survive (and command high prices from antique collectors).

It takes a team to build a business

"A lot of craftsmen do nothing but chairs," the lanky woodworker continues. "And oval-box makers make nothing but oval boxes. But here, since we work in the two scales, our skills get challenged. We really have to have everything together to work in both the boxes, the chairs, and other furniture pieces."

The "we" Charles refers to are James Majcher, his chief assistant, and Ron Seiber, who help Charles keep up on the oval-box making. James, over a 5-year period, has mastered the 18 steps that it takes to recreate an authentic Shaker box. Ron, a machinist by trade, resaws the rough maple and pine lumber into thin stock for boxes and produces the turning blanks for the chairs. With his background, he also keeps the shop's machinery fine-tuned.

Continued

The whys and hows of the Shaker oval box

The nesting oval box, as designed and crafted by the Shakers, appears at first glance to be a rather simple wooden object. But as with most things of Shaker origin, a lot of thought went into it. "Every aspect of its construction has a practical explanation," says Charles:

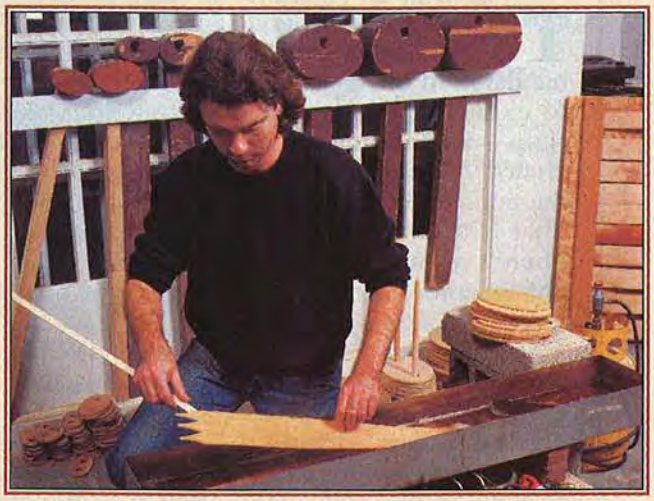
• *Shape.* A round-shaped box encloses the greatest space with the least material. However, an oval box does nearly as well, using narrower boards for the tops and bottoms to avoid warp in larger sizes. And to the tidy Shakers, an oval box more easily fit onto a shelf than a round one.

• *Materials.* Shakers used bands of maple or birch for the sides because those species are close-grained and will retain their strength even when worked thin. On the other hand, maple and birch react too much to moisture to work as tops and bottoms. So the Shakers chose vertical-grain white pine for those parts.

Then, of course, there's the joinery. "There are fast and dirty ways to make Shaker boxes that I don't do," Charles advises. "The swallowtail, for example, is a functional seam for the band that makes up the sides. Those fingers in the swallowtail are a signature part of the box. Shakers didn't allow for much ornamentation, and people think that they broke their own rules with the swallowtails, but that was the best way. The swallowtail responds to wood movement without splitting or cracking. However, the swallowtail has to be cut at

Ron Seiber resaws maple for boxes at the 1951 Moak bandsaw. It has a 24" throat and a blade over 19' long.

Cutting swallowtails on a Shaker oval box should be done with a sharp utility knife. The knife cut burnishes the wood to reduce splintering and moisture absorption.



To soften the maple band for a box side, James Majcher boils it in water for about 20 minutes. A propane camp stove fires the unit.

a chamfer with a sharp knife rather than sawn so that the wood remains smooth and doesn't readily absorb moisture, or splinter with use. On cheap Shaker boxes, they're sawn." (See a box in progress in the photos *below.*)

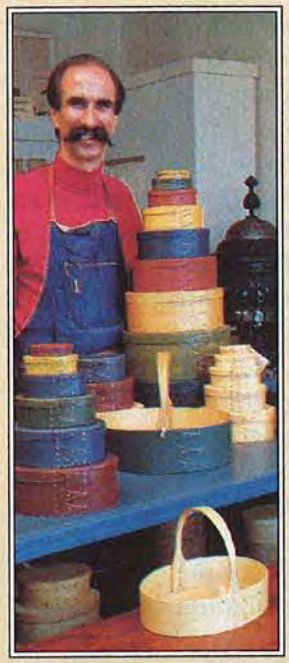
Shaker oval boxes were intended to nest, and the Shakers made them from 2" to about 15" long to store spices, cloth, and what have you. Some were clear-finished with linseed oil, while others were painted. And in Charles' shop you'll find nearly the same variety, starting at $22 for a 3" one to about $75 for one a bit more than 1' long. They're his bread and butter. But when it comes to more involved woodworking, just give Charles an order for a chair or two.

Continued

Still warm and wet from boiling, the maple band is bent around a form made from solid wood.

Copper tacks hold the swallowtail joint together. The Shakers commonly made their boxes with the tails of the joint pointing to the right. And the tacks lined up perfectly.

Simple Gifts



On vacation in 1978, Charles Harvey discovered the quiet college town of Berea, Kentucky, about an hour's drive south of Lexington. Nestled in the scenic Appalachian foothills, the historic little city has always had a strong crafts' tradition fostered by the activities of Berea College—where students earn their education by working at weaving, pottery, woodworking, and other skills.

It wasn't until 1980, though, that Charles realized his dream of moving to Berea, leaving behind a brief masonary career in Chicago. He found employment the first day in town. "I was lucky enough to assist noted Berea dulcimer maker Warren May," Charles recalls. "I also started doing some odds-and-ends woodworking jobs, and eventually had my own shop—a chicken coop outfitted with a Shopsmith and a Sears Craftsman bandsaw!"

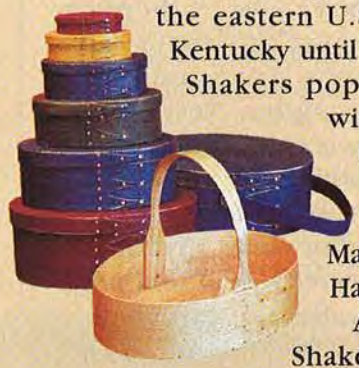
Then one day Charles visited the nearby Shaker Village of Pleasant Hill, the largest restored Shaker community in the U.S. (See "The Legacy" on *page 46.*) The nesting oval boxes that he saw there intrigued him. And no other craftsman in the area was making that popular Shaker item.

Charles set out to learn how they had been crafted by studying originals at Pleasant Hill and taking rubbings. From those, he developed patterns and forms. His oval boxes soon duplicated the originals. Eventually, the enterprising craftsman expanded his woodworking to other Shaker items—blanket chests, sideboards, tables, and his favorite, chairs. He also established Simple Gifts, his present woodworking shop/retail store in Old Town Berea, where the mainstay is still oval boxes.

SHAKER

The Legacy

Commonly known as Shakers, the United Society of Believers in Christ's Second Appearing were a communal religious group that flourished in the eastern U.S. and into Indiana and Kentucky until the late 1800s. Once, the Shakers populated 24 communities with a peak membership of 6,000. Today, only a few elderly Shakers remain at Sabbathday Lake, Maine, and Canterbury, New Hampshire.



Among other things, the Shakers believed in celibacy, and so relied on converts to continue their ways. But it was not this observance alone that doomed them. The Shakers, in search of the perfect society, withdrew from the surrounding world to live apart. Their communities were self-supporting, with every member contributing to the labor pool. As they became expert in manufacturing goods and reaping agricultural harvests, they sold to the public market. And the quality of their goods—from garden seeds to cloth, baskets to boxes and chairs—earned a high reputation.

While the Shakers' communal "industries" strived for perfection, the nation was expanding. Steamboats and railroads made shipping to distant points economical. Industries sprouted to service the new western markets, producing goods and shipping them at a price that the competing Shakers could not match and still survive. So the perfect society that harmonized salvation with toil dwindled and died. But in their inventiveness, the Shakers left quite a legacy; here are but a few of the inventions accredited to them:

- Flat, sewn-corn broom, exact date unknown;
- Circular ("buzz") saw, 1813;
- Tongue-and-groove machinery for edge-joining boards, 1828;
- Ball casters for chairs, 1852;
- Copper vacuum pan for drying herbs (Gail Borden improved it to make condensed milk), 1853;
- Washing machine, 1858;
- Cast-iron fence post, 1859;
- Chimney cap, 1869;
- Window-sash balance and lock, 1870.

Shaker chairs with an Appalachian twist

"What I do is try to blend the tradition of Appalachian ladderback chairmaking, which takes advantage of tight, green-wood joinery, with Shaker style," comments Charles, his right arm sweeping the chairs on display. "And certainly the country tradition of green-wood joinery was part of Shaker chairmaking, too, especially as it was practiced in Kentucky. But what we think of as a classic Shaker chair came from New Lebanon, New York, where they made thousands of chairs and employed pretty much state-of-the-art production techniques for their times."

In any discussion with Charles regarding the Shakers, there's never a doubt that he's a great admirer of their woodworking skills. And so apparently were the judges at the Philadelphia Centennial Exposition of 1876. "The New Lebanon Shakers were awarded a diploma there for their chairs," notes Charles. "In part, it stated that their chairs embodied 'strength, sprightliness, and mod-

At his variable-speed Oliver lathe, Charles turns the chair posts and rungs for chairs. After turning the back posts, he'll boil them and bend them in a form to dry for a week.

Because the back posts are bent as well as flared at the top, the 1"-deep mortises for the rungs must be precisely drilled. Charles relies on a jig to get the perfect angle.

est beauty.' I think about those words when I make my chairs."

Although fashioning oval boxes involves the mastery of certain techniques, making a Shaker chair requires some pretty advanced woodworking skills, of which the most important is turning. Here, Charles started from scratch.

"I had to learn to turn, and one of the biggest things that helped me was turning Shaker pegs," Charles recalls. "I used to come in here and turn Shaker pegs for an hour the first thing each morning. And I discovered that Shaker pegs offer all the cuts you need to do in spindle turning. First, you have to rough the wood out to a cylinder, measure and cut its tenon, then cut down to a shoulder. Next, you make another sizing cut to the bottom of the shaft, cut a cove to the top of the button, and finish by cutting a bead to part it away."

Meticulously turned and sanded posts and rungs, and hand-shaved, bent back slats, a beautiful finish, and bright woven seats all add to the appeal of Charles' chairs (see them in production in the photos *below*). Yet, it's the Appalachian-style greenwood joinery that makes them rival the toughness of the hard maple from which they're made.

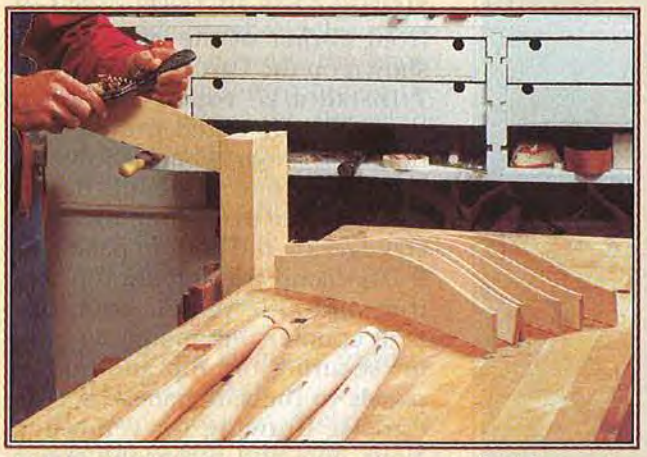
Joinery for the long haul

"What makes the joinery work is using wood dried to two percent moisture content for the rungs, and green wood of 12-percent moisture for the chair posts," explains the Kentuckian. "As the post dries the mortise becomes oval. It also shrinks into notches cut into the tenons on the rung, which locks up the rung in the post. And by orienting the grain of the posts to the direction in which they are least likely to split, the joints last forever."

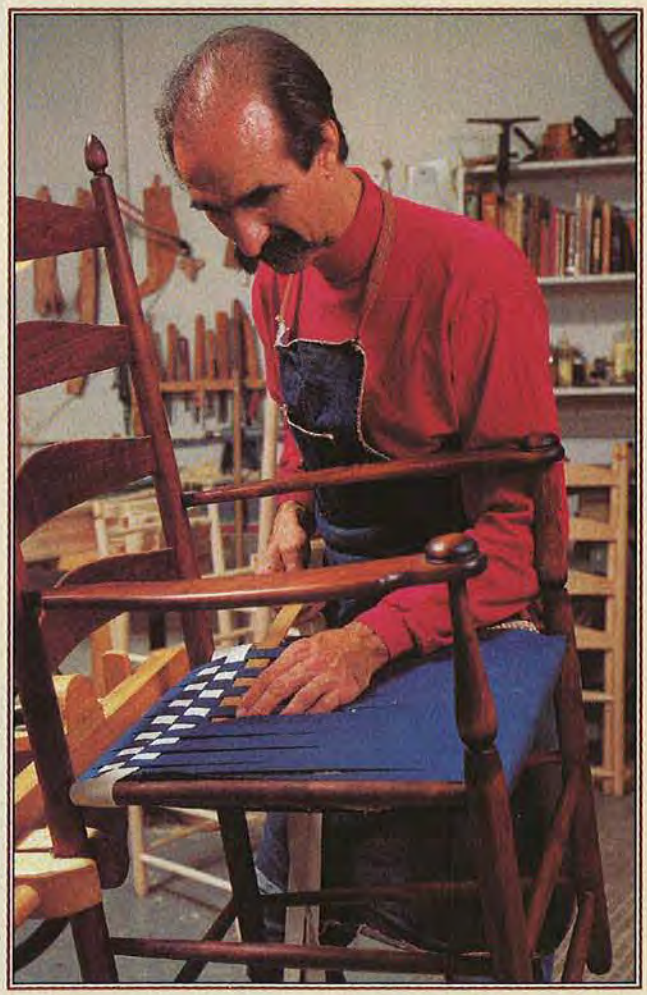
All of Charles' chairs are made in batches of six or eight. Few spare parts carry over. And even those sit around awhile because Charles crafts 81 different chairs based on Shaker designs, and few have interchangeable parts.

"The public believes that if the design is simple, it's gotta be Shaker," Charles observes. "But there's a lot more to Shaker than simplicity."

An important tool in Charles' chairmaking is the story stick—one for each model of chair. Using it as a guide, he marks the overall length of the back posts and the location of mortises.



Each back slat must be sawn to shape, boiled, bent, then chamfered at the top edge by hand with a spokeshave.



Each chair requires three hours of sanding after assembly, beginning with 120 grit. To get a dark tone on the maple, Charles uses aniline dye, followed by three coats of Danish oil. He weaves the seat with strips of yarn-dyed cotton.

Written by: Peter J. Stephano Photographs: Bob Hawks

FLOOR-MODEL Jewelry

My wife's first impression when I showed her the design for this jewelry cabinet was, "It's very nice, but I don't have that much jewelry." Well, after she started pulling things out of her dresser drawers, closet shelves, and the bathroom cabinets, it seemed to be just about the right size. When finished, she filled the little remaining space with family keepsakes and old photographs.

Print this article

Jan Hale Svec
Assistant Design Editor

Start with the carcase assembly

1 Rip and crosscut the carcase top and bottom (A), sides (B), and back (C) to the sizes listed in the Bill of Materials from ¾" plywood (we used maple). See the Buying Guide for our source of a hardwood kit for this project.

2 Using the Carcase drawing for reference, accurately mark the locations and cut a pair of ¾" dadoes ⅛" deep and 12" apart in the carcase top and bottom. Test-cut scrap to verify your dado width is the exact thickness of the plywood. Adjust as necessary. See our article on shimming dado blades on *page 18* for reference.

3 Carefully mark the locations, and cut ½" dadoes ¼" deep 1⁹⁄₁₆" apart on the *inside face* of each side panel (B) where dimensioned on the Carcase drawing.

4 On the *outside face* of each side panel, mark six centerpoints for the shaker peg holes, and drill ³⁄₁₆" holes ¼" deep where marked.

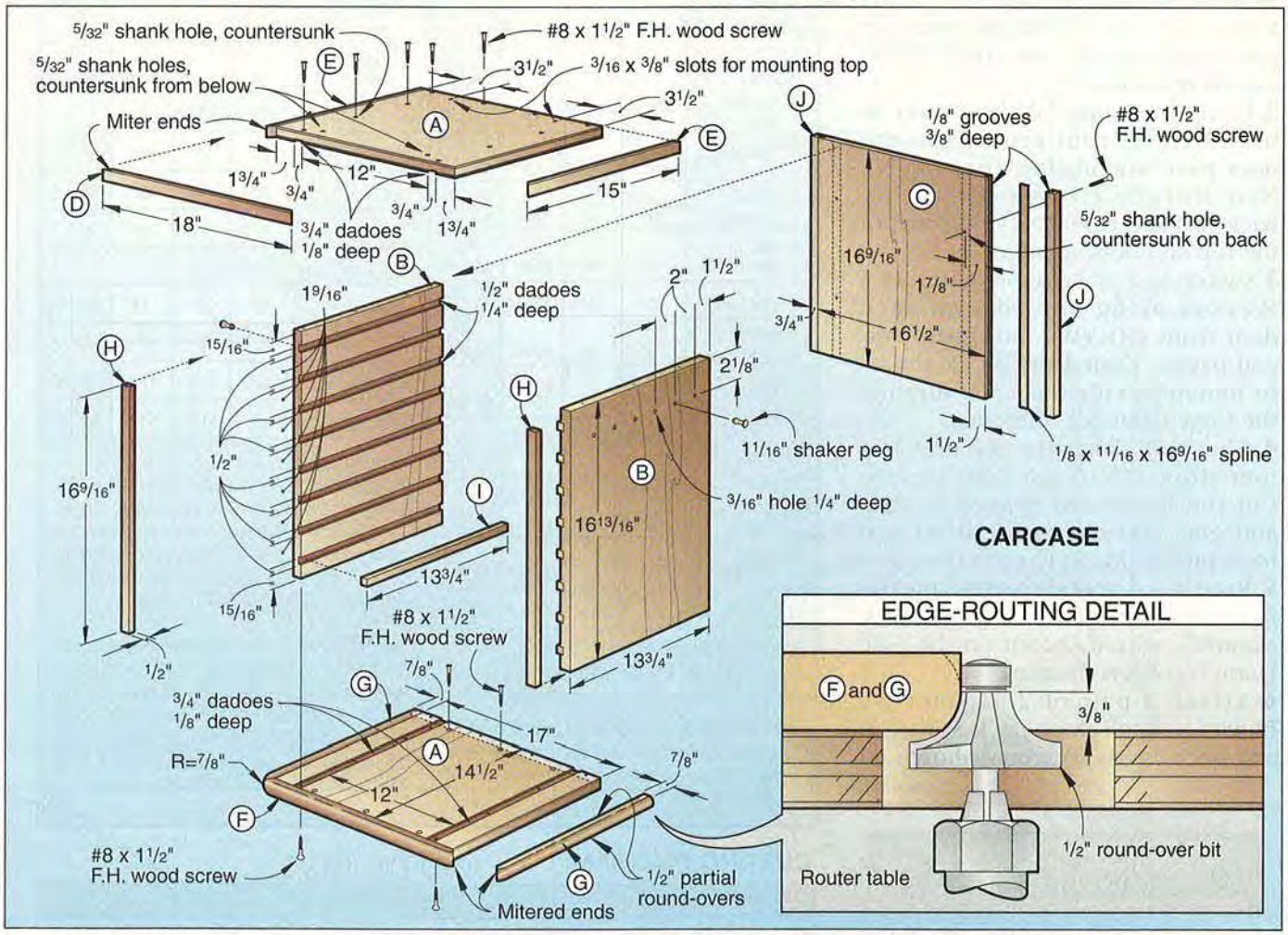
5 From ¾" solid stock, cut the top front band (D) and side bands (E) to size, mitering the mating ends of each. Glue and clamp the banding pieces to the carcase top (A).

6 Cut the bottom banding pieces (F, G) to size, miter-cutting the mating ends. Glue and clamp them to the bottom panel (A). Mark and cut a ⅞" radius on each front corner of the panel where shown on the Carcase drawing.

7 Install a ½" round-over bit in your table-mounted router, positioned ⅜" high where shown on the Edge-Routing detail. Rout a partial round-over along the banded edges on the bottom panel.

8 Dry-clamp the carcase top, bottom and side panels together. Drill countersunk mounting holes for securing the top and bottom panels to the side panels. See the Carcase drawing for reference. Now, glue and screw the assembly together, checking for square.

Cabinet



9 Cut the side-panel front bands (H) to size. Next, cut a pair of 12"-long spacer bars. Using bar clamps, glue and clamp the bands in place, using the spacer bars to hold the side-panel middles exactly 12" apart as shown in the photo *at right.* In addition to hiding the plies on the plywood, the bands help keep the side panels straight. The side panels may have a tendency to bow inward after cutting all the dadoes. Leave the 12"-long spacers in place until after the back (C) is installed.

Let's add the drawer guides and carcase back

1 Rip and crosscut the drawer guides (I) to size. Glue the guides in place, removing excess glue.

2 Cut the back-panel bands (J) to size. Fit your table-mounted router with a ⅛" slot cutter, and rout a ⅛" groove ⅜" deep along the outside edges of the back panel (C)

Using 12"-long spacers to hold the side-panel middles exactly 12" apart, glue the front bands to the side panels.

and along the mating edges of the band strips (J). Since the hinges for the side doors (K-N) mount to the bands (J) later, we felt it important to strengthen the joint with a spline.

3 From ⅛" hardboard, cut the splines to size, and glue and spline the bands to the back panel.

4 Dry-clamp the back panel assembly in place, and drill countersunk mounting holes for securing the back panel to the side, top, and bottom panels. Glue and screw the back panel in place.

The swing-out side doors come next

1 Cut the door panels (K) to size from ¾" maple plywood. From solid stock, cut the door top and

Continued

bottom strips (L), back strips (M), and fronts (N) to size, (we used bird's-eye maple for the door fronts). See the Bill of Materials for part sizes and the Side Door drawing for reference.

2 Using the same ⅛" slot cutter as used before, rout grooves in the door panel and mating strips (M, N). Note that the grooves in the door back (M) and front (N) stop short of the top and bottom edges by ½".

3 Switch to a ⅜" cove bit, and rout a ⅜" cove along one edge of each door front (N). (We did this in several passes, raising the bit each pass to minimize chip-out.) See Routing the Cove detail for reference.

4 Glue and clamp the top and bottom strips (L) to the door panels. Cut the hardboard splines to size, and glue and clamp the front and back pieces (M, N) to each door.

5 Rout a ½" round-over along the front outside corner of each door assembly where shown on the Side Door Top View drawing.

6 Attach a pair of 2" no-mortise hinges to each door back strip (M) and back bands (J) where shown on

Continued

Bill of Materials

Part	Finished Size T	W	L	Matl.	Qty.
CARCASE					
A top & bottom	¾"	17"	14½"	MP	2
B sides	¾"	13¾"	16 13/16"	MP	2
C back	¾"	16½"	16 9/16"	MP	1
D top front band	¾"	½"	18"	M	1
E top side bands	¾"	½"	15"	M	2
F bottom front band	¾"	⅞"	18¾"	M	1
G bottom side bands	¾"	⅞"	15⅜"	M	2
H side bands	¾"	½"	16 9/16"	M	2
I drawer guides	½"	½"	13¾"	M	16
J back bands	¾"	¾"	16 9/16"	M	2
SIDE DOORS					
K panels	¾"	12 1/16"	15 15/16"	MP	2
L top & bottom	¾"	¼"	12 1/16"	M	4
M back bands	¾"	¾"	16 7/16"	M	2
N fronts	¾"	2 3/16"	16 7/16"	BM	2

Part	Finished Size T	W	L	Matl.	Qty.
BASE					
O legs	1¾"	1¾"	21¼"	M	4
P front/back apron rails	¾"	2"	15½"	BM	2
Q side apron rails	¾"	2"	12½"	BM	2
TRIM AND TOP					
R front	¼"	¼"	18½"	M	1
S sides	¼"	¼"	15¼"	M	2
T top	¾"	15⅞"	19¾"	EM	1
DRAWERS					
U sides	½"	2"	14"	M	16
V fronts	¾"	2"	11⅞"	BM	8
W backs	½"	1½"	11⅜"	M	8
X bottoms	¼"	11½"	11⅜"	BP	8

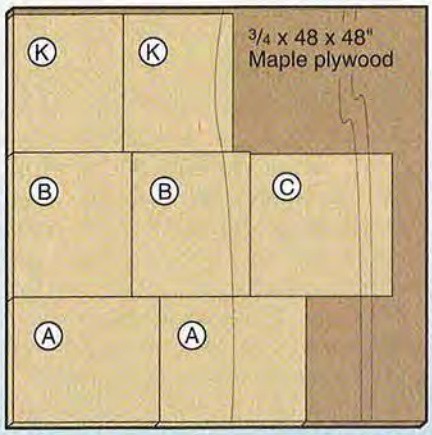
Materials Key: MP–maple plywood, M–hard maple, EM–edge-joined hard maple, BP–birch plywood, BM–bird's-eye maple.

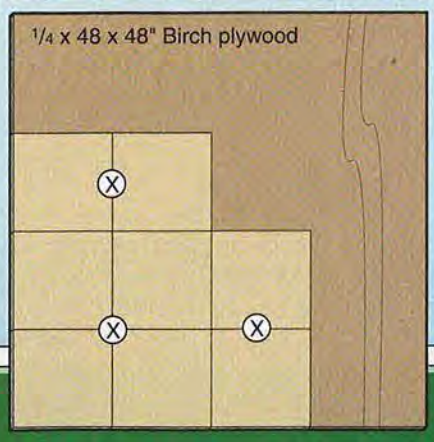
Supplies: #6×⅜" flathead wood screws, #8×1¼" flathead wood screws, #8×1½" flathead wood screws, #8×1¼" roundhead wood screws with #8 flat washers, clear finish.

Buying Guide

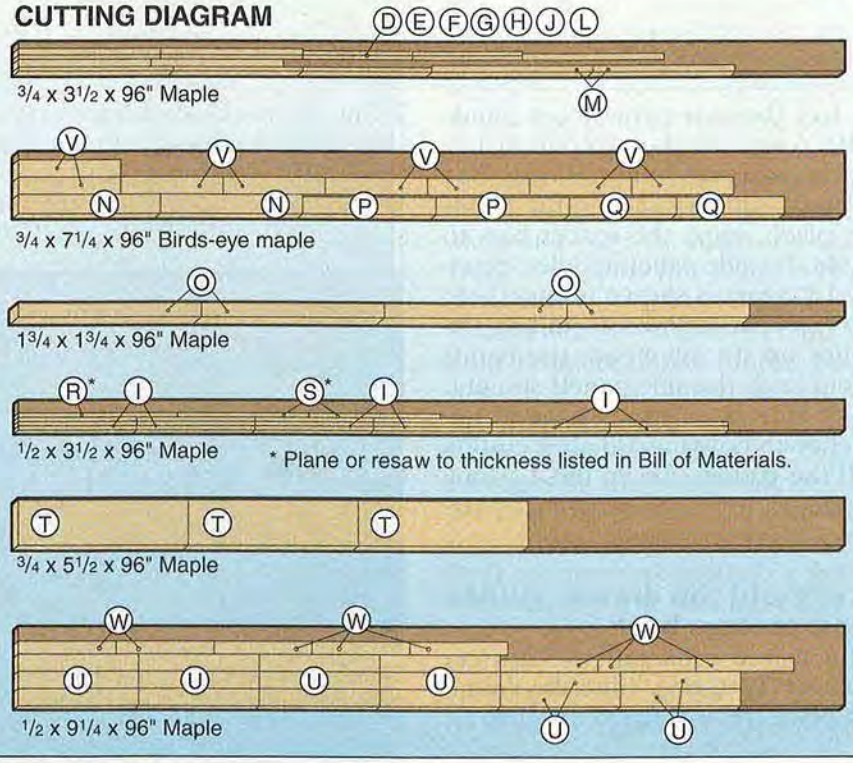
Hardware kit. 16 ½"-diameter solid-brass knobs, two pair of 2" no-mortise brass-plated hinges, 12 1 1/16"-long shaker pegs, and two brass ball catches. Kit no. 128793, $46.94 ppd. Leichtung 4944 Commerce Parkway, Cleveland, OH 44128. Or call 800/321-6840 to order.

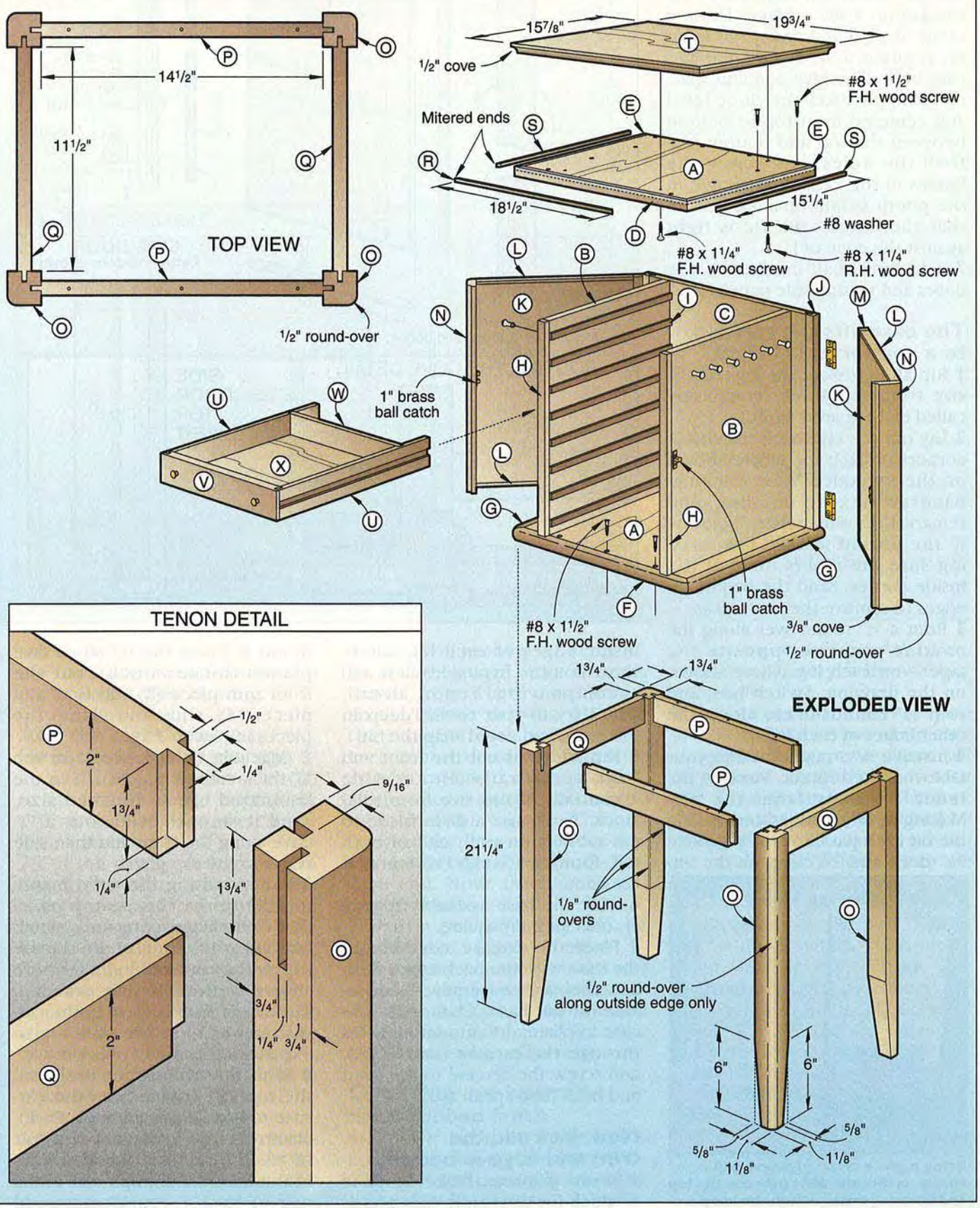
Hardwood kit. All the individual pieces shown on the Cutting Diagram cut slightly oversized in length and width from the thicknesses listed in the Bill of Materials from the type of wood noted. Kit no. W82M, $229.95 ppd. Heritage Building Specialties, 205 North Cascade, Fergus Falls, MN 56537. Or call 800/524-4184 to order.





CUTTING DIAGRAM




TOP VIEW
14 1/2"
11 1/2"
1/2" round-over
15 7/8"
19 3/4"
1/2" cove
#8 x 1 1/2" F.H. wood screw
Mitered ends
18 1/2"
15 1/4"
#8 washer
#8 x 1 1/4" F.H. wood screw
#8 x 1 1/4" R.H. wood screw
1" brass ball catch
#8 x 1 1/2" F.H. wood screw
1" brass ball catch
3/8" cove
1/2" round-over
TENON DETAIL
1/2"
2"
1/4"
1 3/4"
9/16"
3/4"
1/4"
3/4"
EXPLODED VIEW
1 3/4"
1 3/4"
21 1/4"
1/8" round-overs
1/2" round-over along outside edge only
6"
6"
5/8"
5/8"
1 1/8"
1 1/8"

the Side Door drawing. Place the carcase on a flat surface. Using a scrap of plywood and a 1/16" spacer, position door against the carcase back. The plywood and spacer must position the door level and centered from top to bottom between the top and bottom (A). Drill the holes, and screw the hinges to the carcase as shown in the photo *below*, making certain that the hinge knuckle is tight against the edge of J.

7 Add brass ball catches to the doors and mating side panels.

The base lifts the carcase to a comfortable height

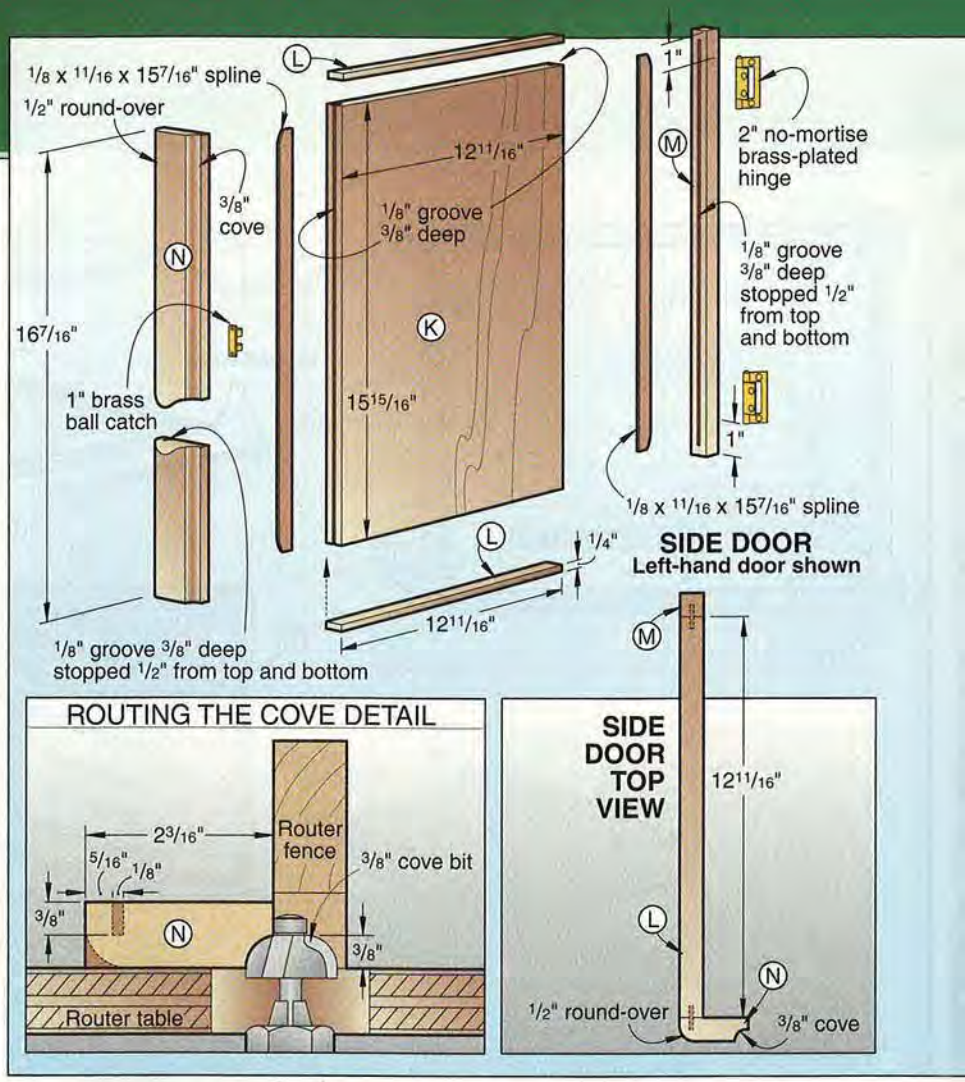
1 Rip and crosscut the legs (O) to size from 1¾" stock (commonly called eight-quarter stock).

2 Lay out the tapers on the *inside* corners of each leg where shown on the Exploded View drawing. Bandsaw next to one line, and remark the other taper. Bandsaw to the second marked line, making sure the tapers meet at the inside corner. Sand the bandsawn edges to remove the saw marks.

3 Rout a ½" round-over along the *outside* corner—opposite the taper—on each leg where shown on the drawing. Switch bits, and rout ⅛" rounds-overs along the other edges of each leg.

4 Install a ¼" straight bit into your table-mounted router. Position the fence ¾" away from the bit. Making several passes and raising the bit each pass, rout a ¼" groove 9/16" deep and 1¾" long on the top inside edges of each leg where shown on the Exploded View and accompanying Tenon detail. Don't try to rout to 9/16" deep in one pass, you could snap the bit.

Using a piece of ¾" plywood and a 1/16" spacer, center the door between the top and bottom panels. Attach the hinges.



5 Rip and crosscut the front and back apron rails (P) and side apron rails (Q) to size from solid stock. Now, use a dado blade to cut rabbets on each end of each rail, forming a ¼×½×1¾" tenon at the ends.

6 Glue the base assembly together, checking for square.

7 Place the carcase assembly on the base with the back edges flush and the carcase centered side-to-side on the base. Clamp the carcase in place, drill mounting holes through the carcase bottom (A), and screw the carcase to the front and back base apron rails (P).

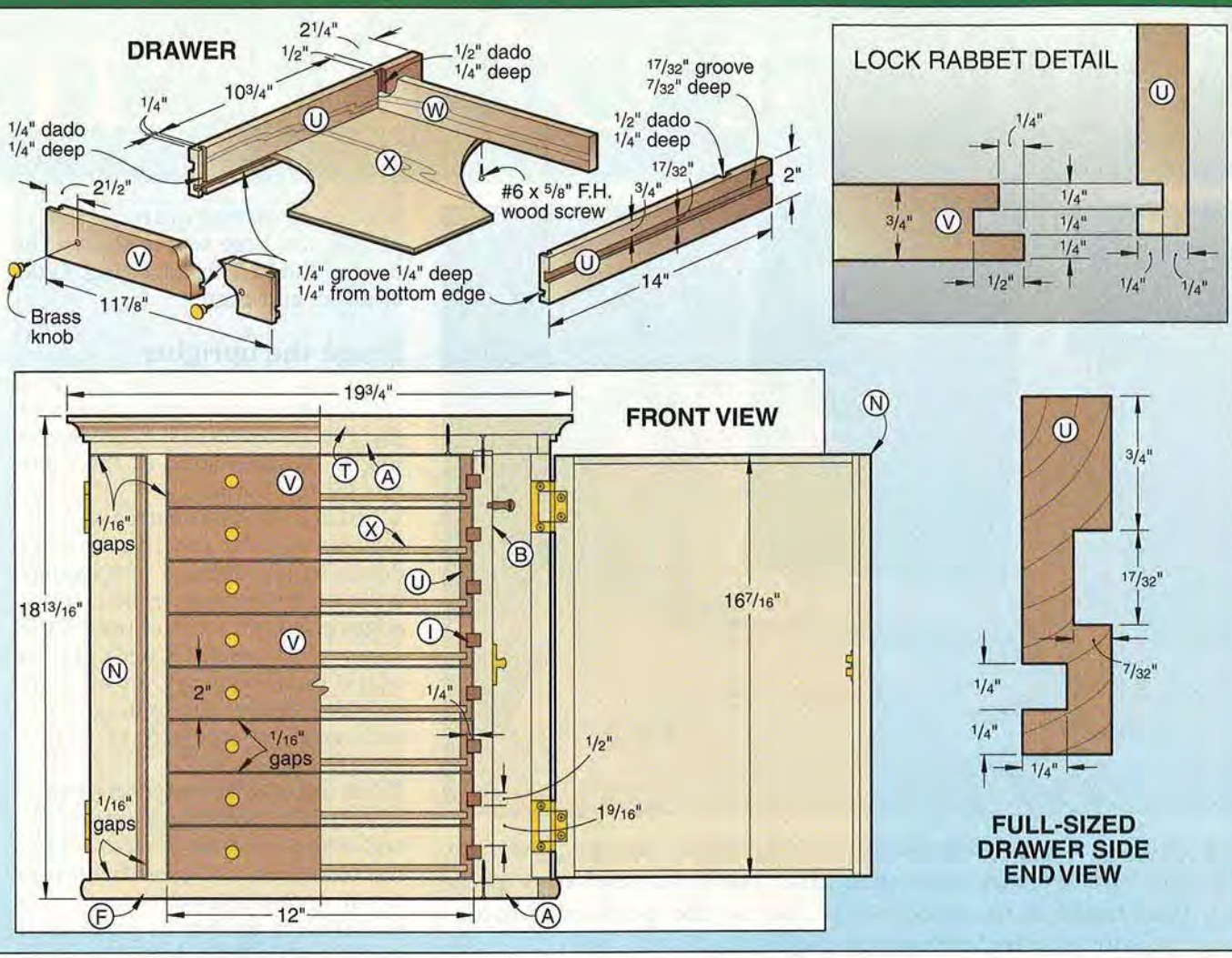
Now, let's add the trim and edge-joined top

1 Resaw or plane thicker stock to ¼"-thick for the maple trim pieces R and S. From the ¼" stock (we planed thicker stock), cut the front trim piece (R) and side trim pieces (S). Glue and clamp the pieces in place.

2 Edge-join enough stock for the ¾"-thick cabinet top (T). Trim the laminated top to finished size, sand it smooth, and rout a ½" cove along the front and then side edges of the top piece

3 For mounting the solid maple top (T) to the carcase top panel (A), drill two countersunk shank holes near the front of the carcase top and two 3/16×⅜" slots where shown on the Carcase drawing. The slots are necessary in the carcase top to allow the solid top to expand and contract over time.

4 With the back edges flush and the top (T) centered on the carcase top-panel assembly (A, D, E), clamp the top in place. Use a pair of #8×1¼" flathead wood screws in the front mounting holes and a pair of #8×1¼" roundhead wood



screws and flat washers to secure the back edge where shown on the Exploded View drawing.

Add the eight drawers for lots of jewelry storage

1 Cut the maple drawer sides (U) to size from ½" maple stock. Mark a "T" on the top edge of each side for reference.

2 Cut the dadoes and grooves in the drawer sides where dimensioned on the Drawer drawing and accompanying Drawer Side detail. To make certain that the drawer guide grooves are in the same location on all drawer sides, place the marked tops against the rip fence when cutting the grooves. As each drawer side is machined, fit the drawer sides in place on the drawer guides (I) to check for proper clearance.

3 Cut the drawer fronts (V), backs (W), and bottoms (X) to size. (We used bird's-eye maple for the drawer fronts.)

4 Cut a ¼" groove ¼" deep ¼" from the bottom edge of each drawer front where dimensioned on the Drawer drawing. Machine the ends where shown in the Lock Rabbet detail. Machine both ends of just one drawer front first. Fit the drawer together and check its fit into the carcase. The gap between the drawer ends and carcase inside edge should be 1/16" on each end. Now, machine all the drawer fronts.

5 Drill a pair of holes in each drawer front to fit the knobs.

6 Glue and clamp each drawer together, checking for square.

7 Fasten the drawer bottoms (X) to each drawer back (W) with #6×⅝" flathead wood screws.

Obtaining our lustrous hand-rubbed finish

1 Remove the hardware and set it aside. Progressing through 120-, 220-, and 320-grit sandpaper, finish-sand all the pieces.

2 Glue the shaker pegs in place, and immediately wipe off any excess glue.

3 Apply the finish. (After trying several different types of finishes over the years, we were all impressed with the finish obtained from using Minwax Antique Oil Finish. (We started by applying a liberal coat of the finish with a foam brush. When the finish just started to get a bit tacky—about 10 minutes after application—we wiped off the excess finish with a clean cloth. After letting the finish dry overnight, we lightly rubbed-out any roughness with #0000 steel wool. We applied several more coats just as we did the first. Our finish had a nice luster without a noticeable buildup often associated with polyurethane finishes.)

Written by Marlen Kemmet
Project Design: Jan Hale Svec
Photographs: King Au
Illustrations: Roxanne LeMoine

Fairest of them

Searching for a good-looking looking glass? Here's one that fills the bill. It's not only attractive, but a fun-and-easy project, too. Build it to stand alone, or as the perfect complement to our jewelry cabinet on *page 48*.

Begin with the base

1 Cut the two base cores (A) to the dimensions shown in the Bill of Materials. We chose bird's-eye maple to match the jewelry chest

2 Install a ¾" dado blade on your tablesaw, and set the cutting depth to ¼". Attach a wooden extension to your miter gauge, extending it at least 1" beyond the dado blade.

3 Place one Part A against the extension, positioning it for a dado ½" from the end. Attach a stopblock to mark the position.

4 Refer to the Base drawing, *right*, then dado each end of each base core. Move the stopblock to cut an additional ¼" from the dado, then widen all four dadoes to 1".

5 Dry-clamp the pieces together with the dadoes facing each other. Cut pieces of scrapwood to fit into the mortises created by the dadoes. Glue Parts A together, aligning the dadoes with the scrapwood pieces. Remove the alignment pieces as soon as the clamps are tight.

6 Cut a piece of stock ¾×2×18". This will become the cove moldings, B and C.

7 Install a ½" cove bit in your table-mounted router. Set the cutting depth to ½", as in the Cove Routing drawing, *opposite page*. In several passes, rout a ½" cove along each edge of the stock.

8 Set the fence on your tablesaw to rip stock to ⅞" wide. Saw the routed edges from the stock to form the cove moldings.

9 Miter-cut the cove moldings (B and C) to fit around the glued-up base core. Place the wide bottom edge of the molding flush with the bottom of the base core, glue, and clamp.

10 Cut two 18" pieces of stock to size for the square molding (D, E). Miter-cut the moldings to fit around the base where shown on the Exploded View drawing. Glue in place, and clamp.

Shape the uprights

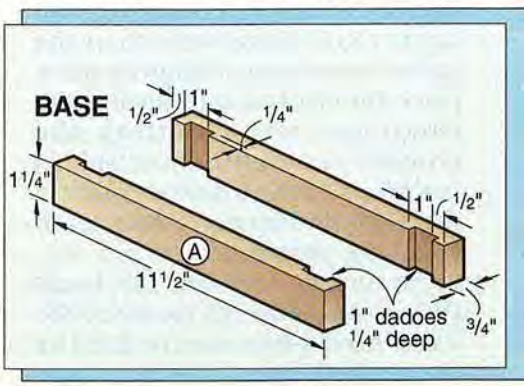
1 Rip and crosscut two uprights (F) to the dimensions shown in the Bill of Materials. Cut several pieces of scrapwood to the same size for test-cutting.

2 Install a ¾" dado cutter on your tablesaw, and set the cutting depth to ⅛". Using a miter-gauge with an extension, rabbet both edges and both faces of one of the scrapwood pieces. Check the fit of the resulting tenon in the base mortises. Adjust the cutting depth and retest as necessary to form a snug-fitting tenon.

3 Cut a tenon on one end of each upright (F). Position a stopblock, and make another pass to widen the tenons to 1¼" (see the Tenon detail, *opposite page*).

4 Chuck a ⅜" bit in your drill press, and drill a hole ⅜" deep in a piece of scrapwood. If a ⅜" dowel fits snugly into the hole, go on to drill the uprights. If not, change the bit size—a snug fit is necessary to hold the mirror in position. On one edge of each upright, drill a centered hole ⅜" deep, ¾" from the top.

5 Stack the two uprights together with double-faced tape, the drilled edges to the same side. Trace the cutting line from the Part F Full-Sized pattern to the top piece. Bandsaw the taper slightly outside



Project Design: Jan Hale Svec Photograph: Hopkins Associates Illustrations: Roxanne LeMoine

A dresser mirror of rare beauty

Bill of Materials					
Part	Finished Size			Matl.	Qty.
	T	W	L		
A base core	¾"	1¼"	11½"	M	2
B* cove	¾"	⅞"	13¼"	M	2
C * cove	¾"	⅞"	3¼"	M	2
D* molding	¼"	¼"	12"	M	2
E* molding	¼"	¼"	2"	M	2
F uprights	¾"	1¼"	7⅛"	M	2
G* frame side	¾"	1"	10"	M	2
H* top/bottom	¾"	1"	8"	M	2
I back	¼"	6⅝"	8⅝"	BP	1
J* stop	⅛"	¾"	9½"	M	2
K* stop	⅛"	¾"	7½"	M	2

* Make oversized initially, then cut to finished size in accordance with how-to instructions.

Materials Key: M-maple, BP-birch plywood

Supplies: ⅜" hardwood dowel, 3⁄32" mirror glass, kraft paper, #4x½" flathead brass wood screws, Minwax Antique Oil Finish.

the line. Sand to the line, and separate the pieces.

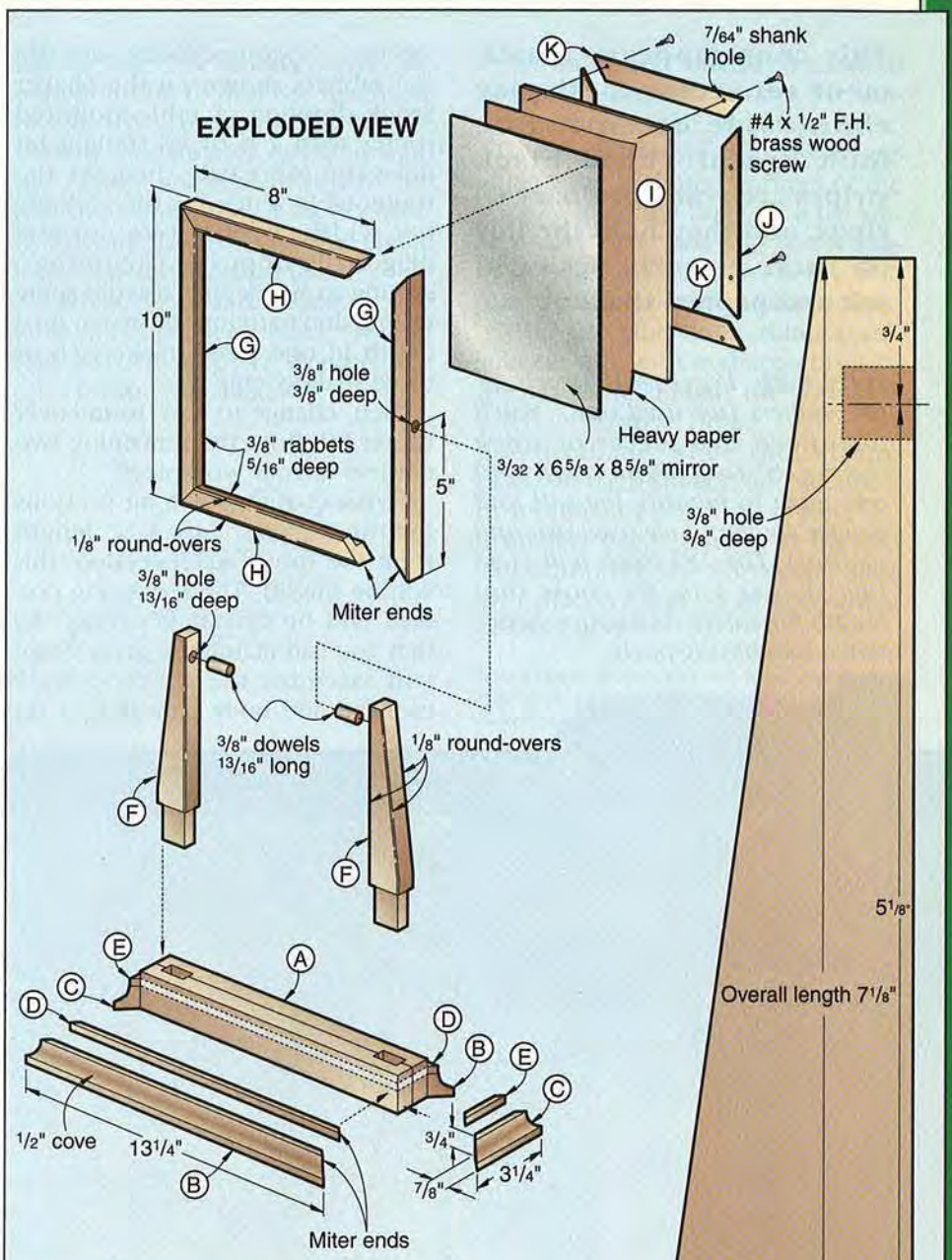
6 Install a ⅛" round-over bit in your table-mounted router. Rout the upright's edges where shown.

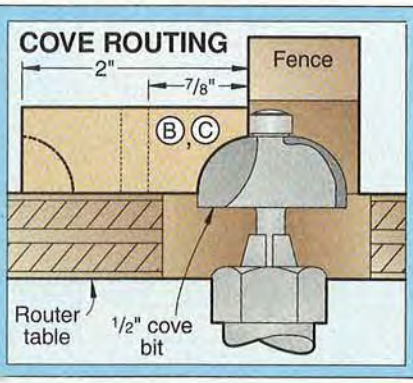
Fashion the mirror frame

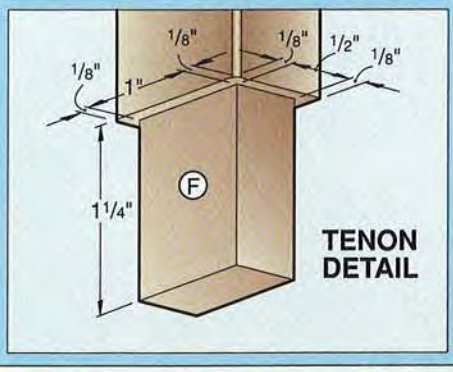
1 From ¾" stock, rip the frame sides, top, and bottom (G, H) to 1" wide. Cut each piece an inch or so longer than the length shown in the Bill of Materials. Again using the table-mounted router and ⅛" round-over bit, rout both front edges of all four pieces.

2 Change to a ⅜" rabbet bit in the table-mounted router. Set the cut-

Continued on page 94







MAKE 'N' SHAKE

This contemporary condiment set seems to display ebony side accents. But, look again! Those black stripes are really ordinary O-rings, and they hold the lids on these cleverly designed salt and pepper shakers.

Start with *1⅝×1⅝×18" stock for the shakers (we used oak). You'll also need two pieces of stock ⅜×⅜×18" (one light wood and one dark to identify the salt and pepper shakers—we used ash and walnut). The 18" stock will yield two shaker sets. We chose that length for safety and convenience when machining parts.*

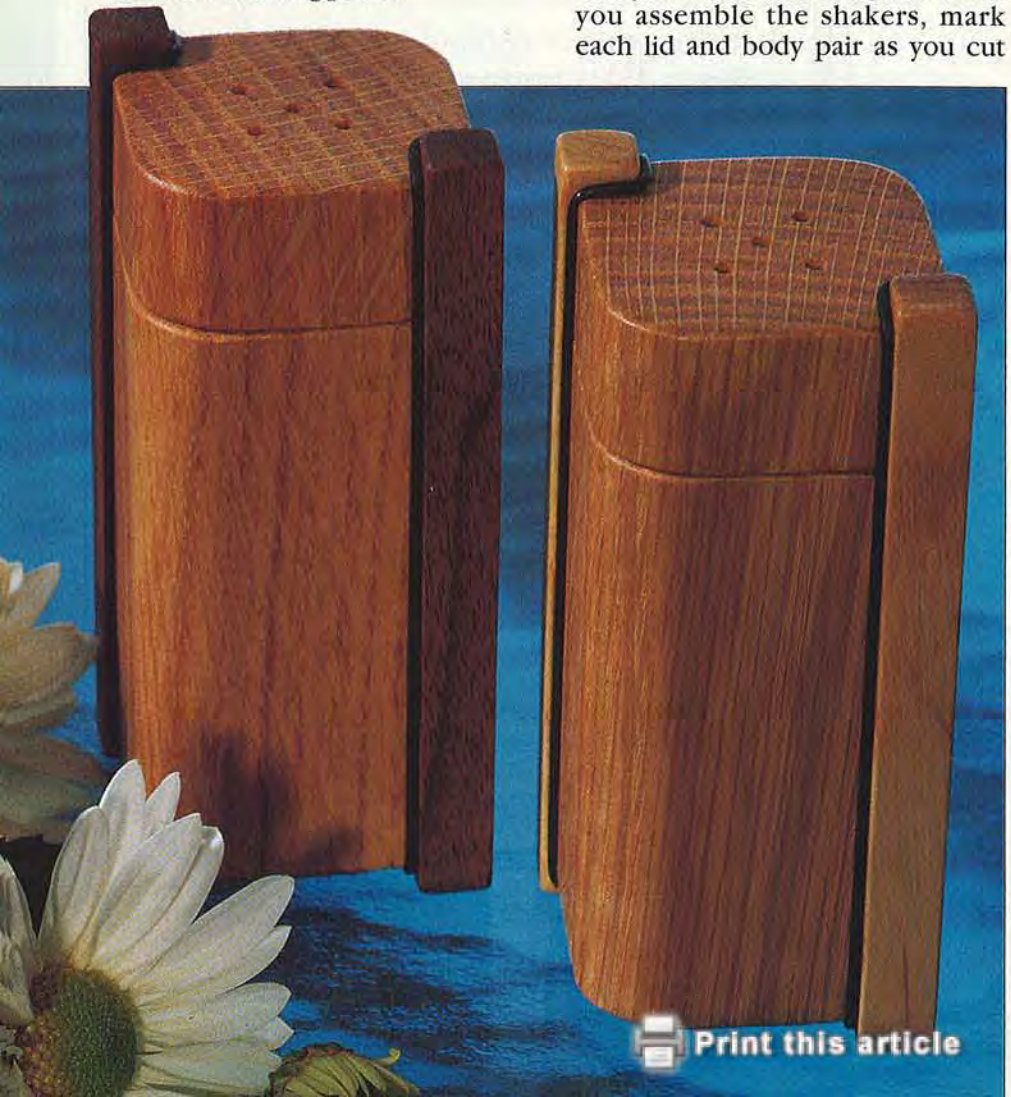
On the 1⅝"-square stock, cut the 5/16" rabbets shown on the Shaker Stock drawing. A table-mounted router with a ⅜ or ½" straight bit does the job easily. Just set the router-table fence for the 5/16" rabbet width. Rabbet two corners diagonally opposite each other, cutting to 5/16" deep. To avoid splintering, don't attempt to reach final depth in one pass—make two or three shallow cuts.

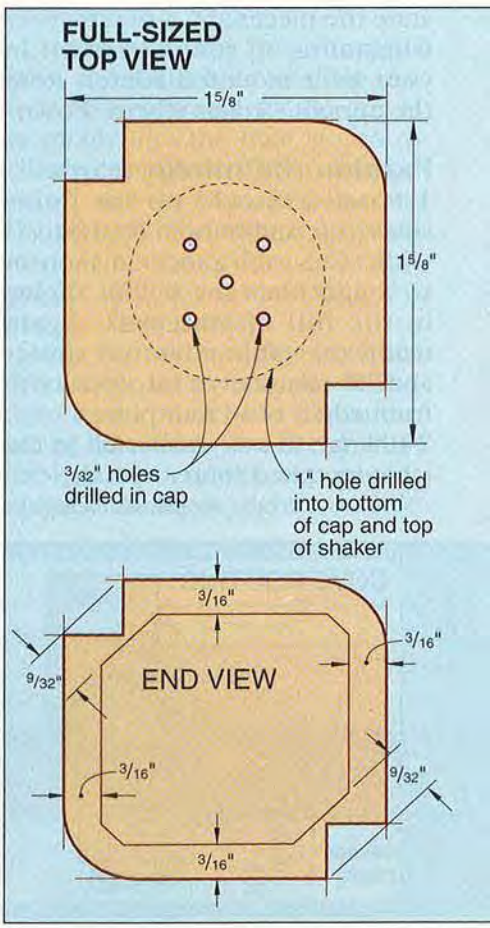
Then, change to a ⅜" round-over router bit. Rout the remaining two corners of your workpiece.

Crosscut four 4⅛"-long sections for the shakers. Saw a ¾" length from the top of each section; this will be the lid. The remaining portion will be the shaker body. So that you can match the grain when you assemble the shakers, mark each lid and body pair as you cut them apart. Draw diagonal lines to find the center on top of each body and on both the top and bottom of each lid.

Now, cut the foot on the bottom of each shaker body. To do this, first attach an extension to your miter gauge. Clamp a stopblock to the extension, setting the distance to the blade at 3⅛", or ⅛" less than the overall length of the shaker body. (See the Sawing the Foot drawing.)

Adjust the tablesaw cutting depth to 3/16". With the top of the shaker body against the stopblock, saw each side in turn. Then, rotate the workpiece, placing one rounded corner against the saw table and a rabbeted corner against the miter-gauge extension. Clamp in position, and cut. Repeat for the other corner.





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SPICE UP YOUR NEXT MEAL WITH THIS DASHING DUO

Raise the saw blade to 9/32" cutting depth. Position the shaker body with a rabbeted corner against the saw table. Make sure both points of the rabbet rest on the surface. Clamp the body to the miter-gauge extension, and cut. Repeat for the other corner.

Chuck a 1" Forstner bit into your drill press. Lower the point of the bit to ¼" above the drill press table, and set the depth stop. Center the bit over the top of the body, and clamp the body securely to the drill-press table or fence. (We gripped the body with a handscrew clamp, then clamped the handscrew to the table with another.)

Bore the hole, withdrawing the bit several times to clear chips. Without changing the depth stop, clamp and bore the bottom of the lid. Change to a 3/32" brad-point bit to drill the five holes in the lid. To locate the holes, draw a 5/8"-diameter circle around the center marked on top of the lid. Drill one hole at the center, the other four where the circle intersects the diagonal lines.

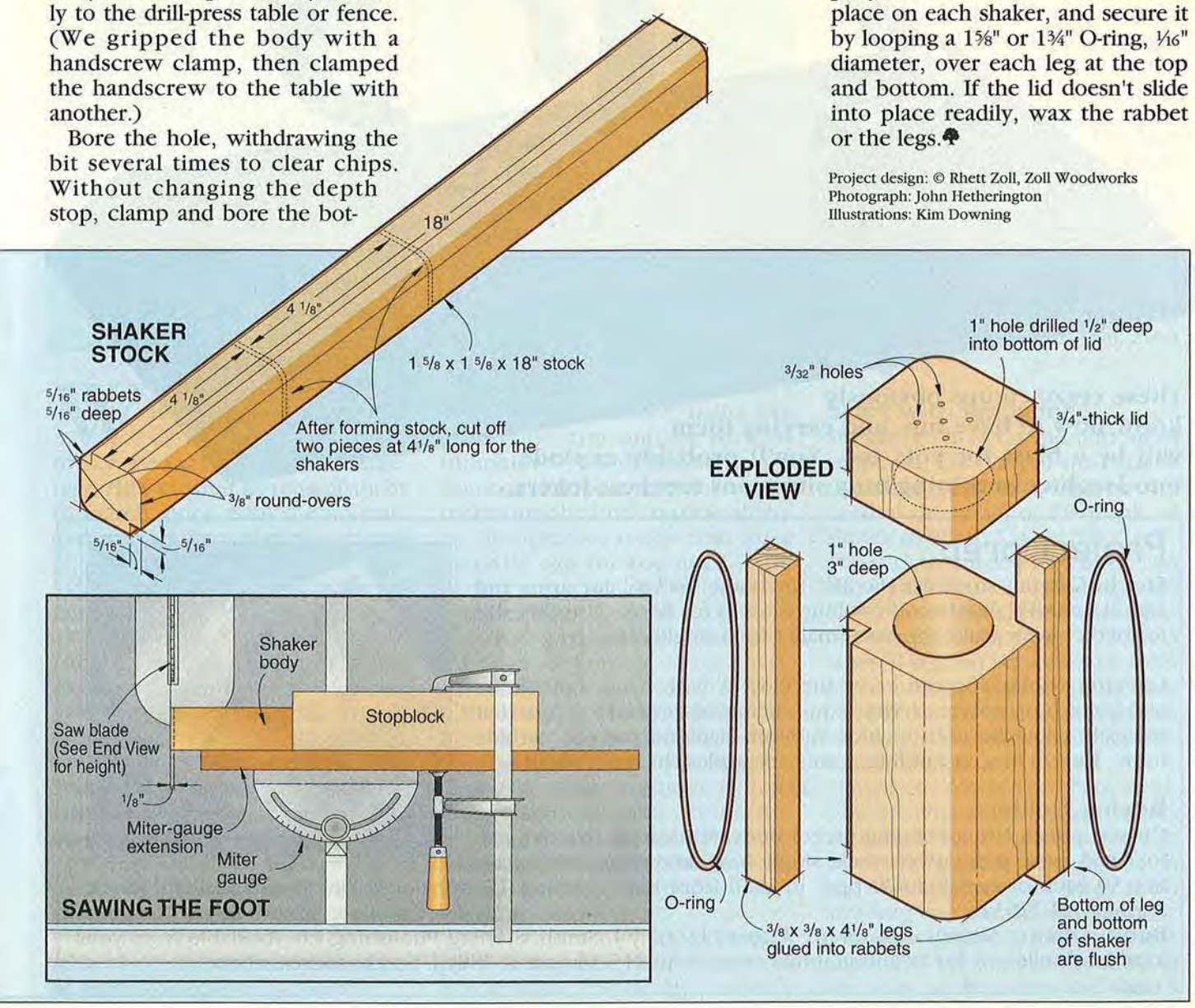
Cut the 3/8"-square stock to 4 1/8" lengths for the legs. Make walnut legs for the pepper shaker, ash ones for the salt shaker.

Sand all parts. Slightly round all edges and corners, except the outside corners of the rabbets.

To assemble, apply woodworker's glue to the rabbeted corners of the body. Stand the body on a flat surface, and locate the legs in the rabbets. Set them flush with the bottom, and clamp with rubber bands.

After the glue dries, remove any squeeze-out with a sharp chisel or X-Acto knife. Finish the outsides with salad bowl oil or polyurethane. Slide the lid into place on each shaker, and secure it by looping a 1 5/8" or 1¾" O-ring, 1/16" diameter, over each leg at the top and bottom. If the lid doesn't slide into place readily, wax the rabbet or the legs.

Project design: © Rhett Zoll, Zoll Woodworks
Photograph: John Hetherington
Illustrations: Kim Downing



CLOWNING

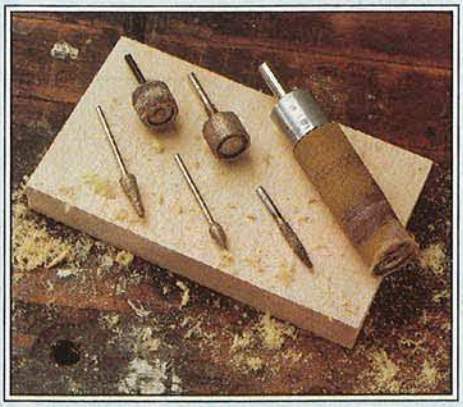
Carve this pair

These crazy cutups obviously know how to have fun, and carving them will be a blast for you, too. You'll probably explode into laughter imagining zany situations for these jokers.

Project prep

Stock: Carving stock ¾×1¼×2¾" for body; ½×3×6" for arms and legs. 1×4¾×8¾" hardwood (walnut shown) for base. (Use this size for two clowns; make the base smaller for a single clown.)

Carving tools: You can carve the clowns with hand tools (knife and gouge) or power-carving equipment. Power-carving bits that typically could be used include ruby or diamond carvers, carbide burrs, Kutzall bits, or sanding drums, examples shown at *right*.



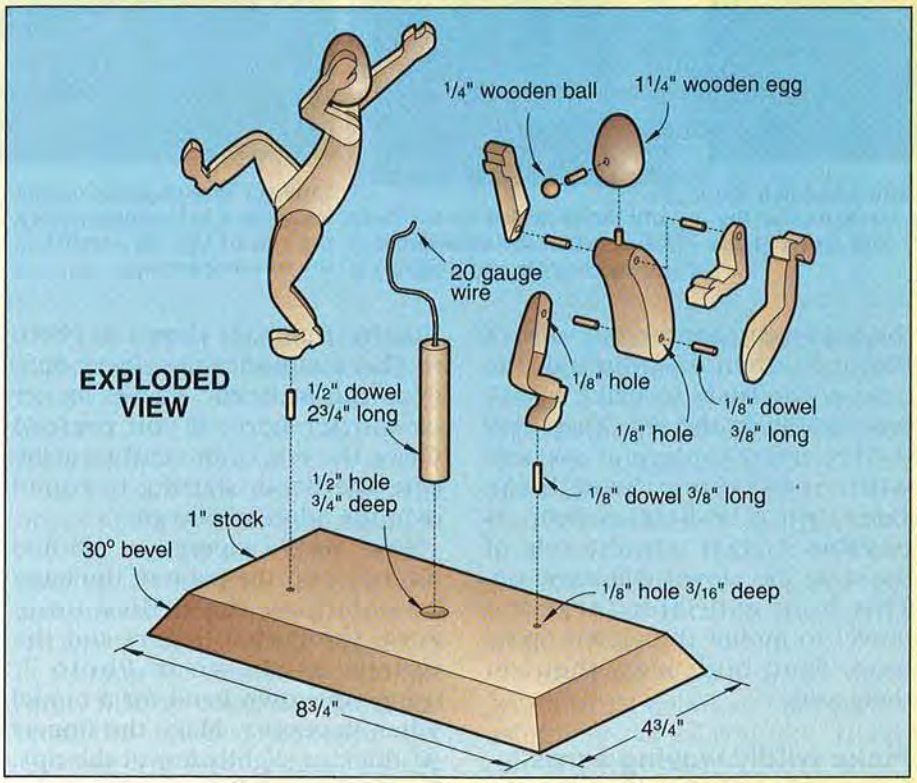
Buying Guide

Clown parts. Kit containing precut body, arms, legs, wooden egg for head, nose pin, dowel stock, single base, and chenille for hair, $10.50 each or two for $20 ppd. in U.S., from Billy J. Smith, 12 Appaloosa Dr., Holiday Island, Eureka Springs, AR 72632.

Book. *Carving Clowns and Circus Wagons* by Billy J. Smith, Sterling Publishing Co. Available from your local bookseller, or for an autographed copy, send $15.85 ppd. to Billy J. Smith, address above.

Print this article

AROUND
of jolly jesters



When it comes to carving, Billy J. Smith really clowns around. That is to say, he carves comical characters. He's created dozens of them to march along with the animals and wagons in a miniature circus parade—now more than 18 feet long—he's putting together at his Eureka Springs, Arkansas, home.

For sheer enjoyment, Billy's clowns are hard to beat. "Clowns exaggerate their features—the bigger their feet or noses, the wilder their hair, the funnier they are to the audience," Billy points out.

"Most professional clowns copyright their costumes and facial makeup to prevent others from copying them exactly," Billy notes. "This makes every clown an original, which works out just great for the woodcarver," he adds, "because any way you shape or finish your clown is correct."

For this project, Billy chose a simple skinny clown, using the same body, arm, and leg patterns to achieve two different poses. You could make a portly clown by redrawing the body outline slightly. He opted to use a craft-store wooden egg for the head—you could carve a realistic head with a detailed face, if you like, or use a miniature plastic doll's head (also from a craft shop).

Cut out the clown parts

Photocopy the full-sized patterns for the body, arms, and legs on *page 100*. Trace the body pattern onto ¾"-thick stock. Trace the arms and legs onto ½" stock. Scrollsaw the parts. Drill two ⅛" holes through the body blank where shown.

Next, figure out your clown's pose. Remember, these characters run around frantically, making extravagant gestures, so plan arm and leg positions that will capture some action. Don't just stand your clown straight up. With only the sawn blanks for the legs and arms, arranging a pose takes a little imagination. But you can get a rough idea at this stage, then fine-tune the pose later. When you determine positions you like, mark the left and right arms and legs for each clown.

(To recreate the poses shown, make the body blank's concave side the front of the striped clown, the convex side the front of the polka-dot clown. The legs go on the big end of the body blank for each clown. For the striped clown, put Leg 1 on the left; Leg 2 on the right. On the polka-dot prankster, Leg 2 goes on the left; Leg 1, the right. The arms are the same for both clowns, Arm 1 on the left and Arm 2 on the right.)

Start with funny feet

Sketch the heel on the bottom of each foot. Center it at the back of the shoe, and make it about a third of the width of the blank, as shown in Photo 1, *next page*.

Carve the heel to shape, as shown in Photo 2. A small tapered Kutzall or ruby carver works just fine. As you form the heel, carve a tapered section between the front of the heel and the ball of the foot (where the shoe bends), as shown in the photo. Square off the bottom of the leg.

Shape the toe of each shoe next. The clowns shown wear shoes with boxy toes, square across the front and slightly rounded from top to sole. You could shape them any way you like, however. Carve a shallow groove around the toe about 1/16" up from the bottom of the sole to separate the shoe's

Continued

CLOWNING AROUND

Center the heel outline on the bottom of the leg blank. For clownish feet, make the heel narrower than the front of the shoe.

Form the heel and establish the cuff line at the back of the leg. Shape the insole and front of the shoe.

Add some wrinkles at the knee. Notice the lines delineating the sole and heel.

Sand the mating plane on the leg with a belt sander. Keep the calf of the leg parallel to the sanding surface.

upper from the sole. Carve a similar line around the top of the heel.

Carve the pants cuff before shaping the lower part of the leg. To avoid the toothpick-leg look, form a slightly oval cross section. Make it a little larger from side to side than from front to back.

Work your way to the knee, rounding the edges to make the oval shape. The size of the leg depends upon the look you want. The clowns shown sport stylish bellbottoms, so the legs are a bit smaller above the cuffs. For a baggier look, make a larger leg.

Cut in several grooves fanning out from the back of the knee to represent folds and wrinkles in the pants. Shallow cuts with the corner of a tapered bit are all you need, as shown in Photo 3 *above*.

Round over the outside of the upper part of the leg. On the inside, round over the leg only from the knee to a point ¾" back from the knee (measured from the front of the knee).

Then, on the inside of the leg, sand a flat plane tapering from there to the hip, the rounded end where the leg joins to the lower part of the body. A belt sander does the job nicely, as shown in Photo 4. Keep the lower part of the leg (the tibia) parallel to the sanding surface as you work.

Complete both legs, then drill a ⅛" hole in each to join it to the body. Here's how: To mark the hole's location, roughly position the leg on the appropriate side of the body, then drill through the hole in the body to make a shallow dimple in the leg. Then drill the leg, going as deep as you can without breaking through the side. Drill a ⅛" hole as deep as possible straight into the sole of the shoe the clown will stand on. This hole will later receive a dowel to mount the clown on its base. Sand both legs, then set them aside.

Make wildly waving arms

Lay out the carving lines for the hands. The shaded areas on the Hand Layout illustration on *page 100* show the material that you carve away. (The illustration shows Arm 2 laid out with a right hand—place the thumb on the opposite side for a left hand.)

Drill a ⅛" hole through the blank where shown. Then, starting at the end of the blank, carve down to the knuckle line, as shown in Photo 5 on the *opposite page*. For a pointing finger, as shown on the striped clown's right hand, carve only about three-fourths of the way across the end, leaving a long piece in front of the thumb.

Next, rough out the thumb. Carve the shaded area on top of the blank down to the level in front of it. Leave the thumb about one-fourth the width of the blank.

Starting at the point of the knuckles and going back ¾", carve about ⅛" deep on the side opposite the thumb, as shown in Photo 6. This establishes the sleeve cuff. (You can make the sleeves longer or shorter here, if you prefer.) Carve the rest of the cuff to delineate the hand, starting to round over the edges as you go.

Now, with a tapered or pointed bit, open up the palm of the hand by enlarging the drilled hole. Form the curled fingers and the thumb, as shown in Photo 7, using your own hand for a model when necessary. Make the fingers ⅛" thick or slightly less at the tips. If you're modeling a pointed finger, extend it straight out.

Round the arm from the sleeve cuff to the shoulder. Then, position the arm against the body to determine the shoulder angle. When you find the angle you like, draw guidelines on the arm parallel to the side of the body.

Sand each arm to the guidelines, forming an attachment surface as on the legs. Then, mark the attaching-hole positions as you did for the legs. Drill the ⅛" dowel hole in each arm.

It's body-building time

For each clown, cut two pieces of ⅛"-diameter dowel rod about 1" long. Slide them into the holes through the body, letting about ⅛" extend from each side, as shown in Photo 8.

Position the arms and legs on the body, and mark them for alignment. Ensure that the legs and

Carve the knuckles of the curved fingers. The shaded area will be cut away to form the thumb.

Shape the hand and establish the cuff line before carving the palm.

Form the palm of the hand by enlarging the drilled hole with a tapered carving bit.

The leg fits over the dowel end at the bottom of the body. The contours won't match, but you can carve and fill to blend the legs into the body.

A bead and a dowel make a large nose for the clown.

arms fit tightly against the body sides, then glue them into place. Clamp the legs with rubber bands around the hips, and tape the arms in place until the glue sets.

With a ruby carver, shape the upper and lower body to blend in the legs and arms. Since you're making clown caricatures, not anatomical models, you can take whatever liberties seem necessary in shaping the shoulders and hips. Apply filler to cover the joints and blend the surfaces, as needed.

Round the body edges. At the top of the body, drill a ⅛" hole about 3/16" deep midway between the shoulders. The neck dowel will fit into this hole to attach the head. Sand the completed body. After sanding, carve any desired details, such as buttons or a belt.

A real egg-head clown

Make a simple head for your clown from a ⅞×1¼" wooden egg (available from craft-supply dealers). For the neck, drill a ⅛" hole about 3/16" deep into one end of the egg. The hole can go at either end of the egg, depending on the effect you want.

The striped clown shows the pointy-head look achieved by drilling the neck hole into the large end of the egg. The polka-dot clown's broader forehead results from drilling at the small end of the egg. Glue a 5/16" length of ⅛" dowel into the neck hole, but don't attach the head yet.

Color your clown brightly

Before painting the clown, glue a piece of ⅛" dowel into the mounting hole in the bottom of the foot. Cut the piece long enough to leave about ¼" extending from the foot. Drill a hole for the dowel in a piece of ¾"-thick scrapwood about 2" square. Use this as a temporary base to hold the clown while you paint.

Paint the clown body with acrylic artist colors or craft paints, using any colors you like. Hands can be either flesh color or white, as if wearing gloves. Billy paints the base color with a brush, then adds the dots or stripes. To paint polka-dots, Billy recommends using a dowel instead of a brush. "Just dip the end of a dowel, one about 4" long, into the paint, then touch it to the clown at random spots," he advises. To make stripes on a clown's clothes, he uses paint markers, available from craft or hobby suppliers. Glitter Magic, also a craft-shop item, gives these clowns their glittery cuffs and collars.

Paint the head flesh or white. Mark the nose location about halfway up the front of the egg. To make a bulbous, red clown-style nose, just stick a map pin—the kind with a round sphere for a head—into the egg at the marked point. (You'll probably have to drill a 1/16" pilot hole for the pin, then cement the nose in place with epoxy.)

If you want to give your clown a larger nose, you could glue on a red pom-pom. Or, you could slip a ¼" bead over a ⅛" dowel inserted into a hole in the egg, as shown in Photo 9. The clowns in the photograph feature noses of this style. Sand the end of the dowel and the bead flush, then paint the nose.

You can either paint on the eyes (paint markers do a great job here) or glue on glass eyes from a craft shop. Glass eyes 5mm in diameter (about 3/16") work well on clowns this size. Position the eyes about ⅔ of the way up the face (1 3/16" on the 1¼" egg).

Complete the clown makeup with paint or markers. High, arching eyebrows and a large mouth are typical clown features, but you can do what you want. It's your clown.

Fashion your clown's hairdo from a chenille bump, a pipe cleaner, or a scrap of fuzzy fabric. The bins at your local craft shop will yield other items to dress up your clown, like the small silk rose on the polka-dot clown.

Mount a single clown on a base, or mount two or more for an action scene, as shown. (The base shown measures 1×4¾×8¾".) Make other props as desired. The stick of TNT shown is a 2¾" length of ½" dowel painted red and labeled. A piece of wire with a carved flame on top serves as the fuse. The explosive sits in a ¾"-deep hole in the base.

Project Design: © Billy J. Smith Photographs: King Au; John Hetherington Illustrations: Roxanne LeMoine

TWO OF A KIND

TWIN BEDS OR BUNK BEDS, THE CHOICE IS YOURS

Looking for a stylish, original bunk bed design? How about just a terrific-looking twin bed? This versatile project suits both interests. For bunk beds, simply invert one bed on top of the other, and reposition its plywood mattress support. Best of all, this size fits kids and adults alike.

Note: Our bed was designed to fit a 39×75" twin mattress. Adjust accordingly for a different size mattress. Also, the how-to instructions are for one bed, double the quantity for making two beds.

Start with the laminated and mortised legs

1 From ¾" oak, cut six headboard-leg parts (A) to 2⅜×34½" and the footboard-leg parts (B) to 2⅜×27". (Using these dimensions, the pieces are ⅛" oversized in width and 1" in length so you can trim flush the edges and ends of the laminated legs later. See the Leg Assembly drawing for reference.)

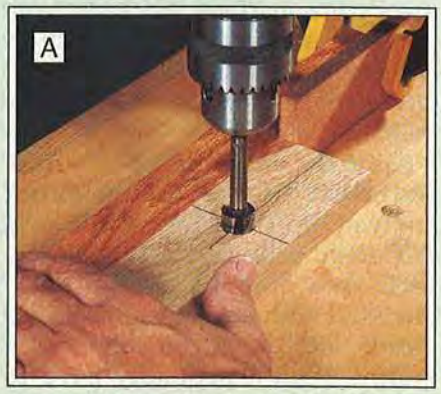
2 Using the Leg Assembly drawing, lay out the notches and mortises on each piece where dimensioned. Remember that you're making a matching pair of headboard and footboard legs, with each pair having a left and right member. Verify the marked locations before cutting.

3 Using a drill press fitted with a ½" Forstner bit and a fence with a stop, drill holes inside the marked mortise outlines. Square-up the mortises with a chisel. You also could cut the mortises to shape with a jigsaw.

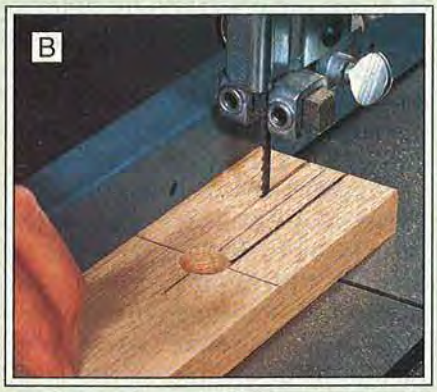
4 Cut the three notches in the center pieces. (To expedite our notch-making process, we marked centerlines on each end of each middle piece where shown in Photo A. Then, we used a ¾" Forstner bit, and drilled a hole centered over each centerpoint. As shown in Photo B, we set the fence on our bandsaw, and cut to the hole to finish forming the mortises. The round bottom on our mortises did not affect the structural integrity of the project.)

5 Mount a dado blade to your tablesaw, and cut the 1³⁄₁₆×6" notch in each center piece.

6 As shown in Photo C, spread an even coat of glue on the mating surfaces of the three pieces making up each leg. With the edges and ends flush, glue and clamp the pieces face-to-face to form each headboard leg (A) and each footboard leg (B). Wipe off excess glue with a damp cloth, and remove the glue from the notches and mortises.

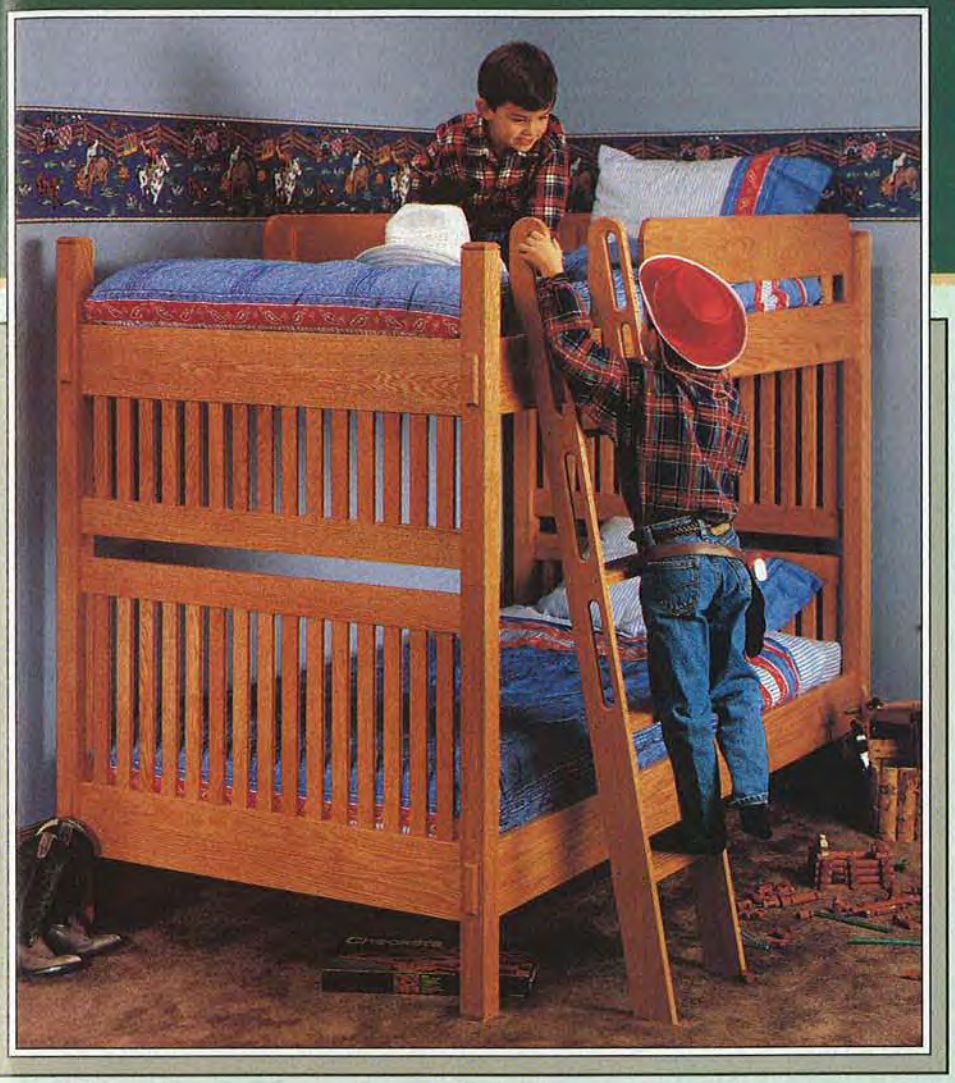


Using a Forstner bit in your drill press, drill a ¾" hole at the marked centerpoint on each leg centerpiece.



Position your bandsaw fence to cut to the hole, creating ¾"-wide notches in the center leg pieces.

Print this article



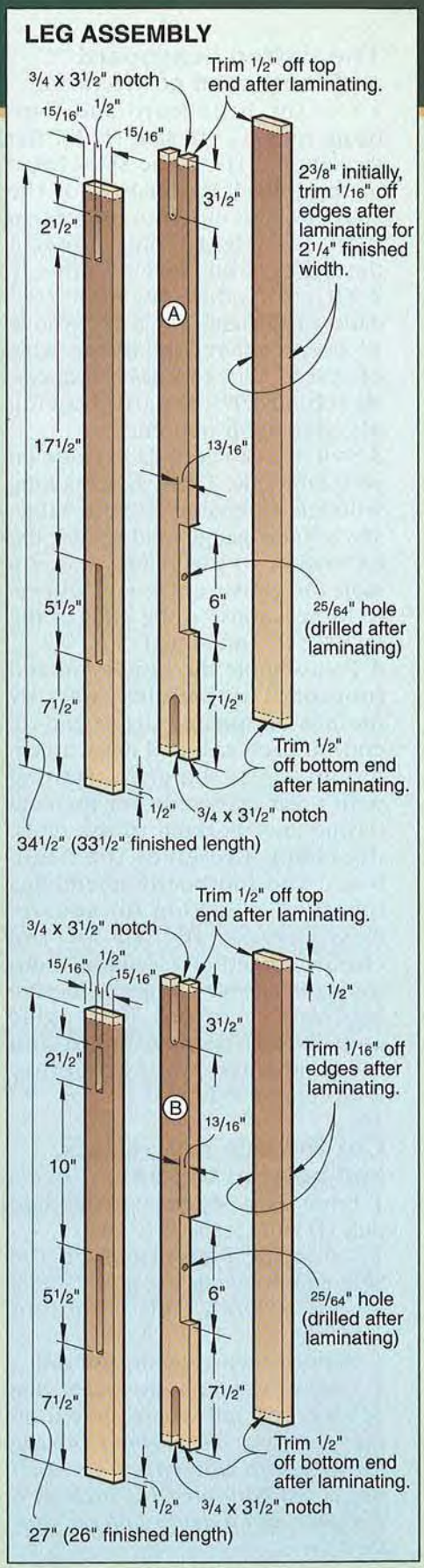
7 Scrape the excess glue from the edges. Then, joint or plane 1/16" from each laminated edge for a 2¼"-square lamination.

8 Crosscut ½" from each end so headboard legs (A) measure 33½" long and the footboard legs (B) measure 26" long. For level side rails later, make sure when trimming the legs to final length that the bottom of the mortise in each leg is 7" from the bottom trimmed end of each leg.

9 To form the bolt-access holes, attach a fence and stop to your drill-press table. Then, drill a 1" hole ½" deep with a 25/64" hole centered inside and 10" from the bottom end of each leg where shown on the Side Rail drawing. Sand the legs smooth.

Continued

Spread an even coat of glue on the mating surfaces, and glue the three pieces together that form each leg.



The slatted headboard and footboard come next

1 Cut the headboard and footboard rails (C, D), slats (E, F), and spacers (G, H) to the sizes listed in the Bill of Materials. (For the spacers, we cut four pieces of stock to ¼×⅝×40", and crosscut the spacers from the long strips.)

2 Fit your tablesaw with a ¼" dado blade, and cut a ¼" groove ½" deep centered along one edge of each rail (C, D). See the Headboard/Footboard drawing *below right* for reference.

3 Switch to a wider dado blade on your tablesaw. Then, attach a long wooden extension to your tablesaw's miter gauge, and square the extension to the blade. Using a stop for consistency, cut rabbets to form tenons on the ends of the rails (C, D) and slats (E, F).

4 To assemble the headboard and footboard assemblies, start by finding the center (from end-to-end) of each rail, and mark a centerline across the grain. Starting with a slat centered over the centerline and working to the ends, dry-clamp (no glue) the headboard and footboard assemblies together, checking for square. Now, check the fit of the clamped-together assemblies into the mortises of their respective legs. After verifying the fit, glue and clamp the headboard and footboard assemblies together between the legs.

Cut the side rails, cleats, and bottom to size

1 From 1⅛" stock, cut the side rails (I) and cleats (J) to size.

2 Using the dimensions on the Side Rail drawing, cut the ¾"-thick tenons on both ends of all four side rails.

3 Mark the centerpoint, and drill a 1" hole ⅞" deep on the *inside* face of each side rail where shown on the drawing. *To prevent boring through the side rail, you must use a flat-bottomed bit such as a Forstner and a depth stop on your drill press.*

Continued

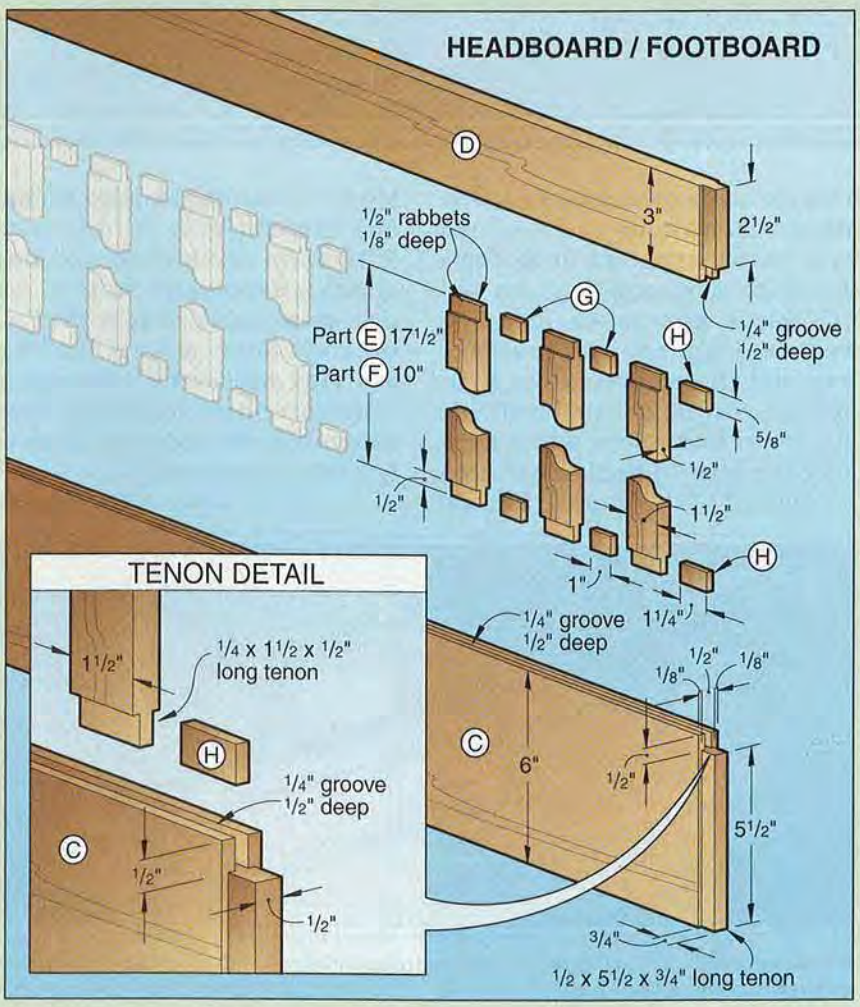
Bill of Materials
Enough for two beds

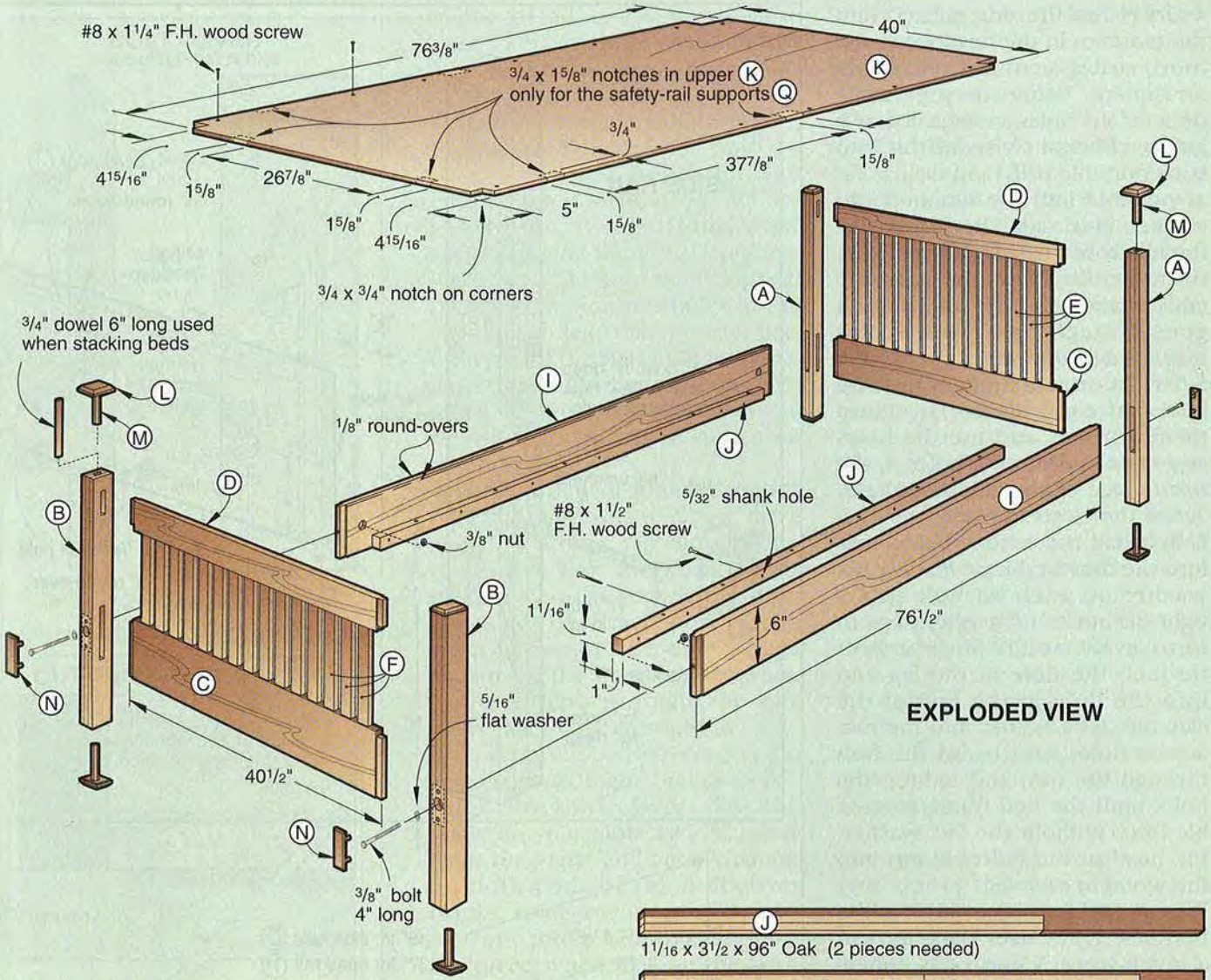
Part	Finished Size T	W	L	Matl.	Qty.
LEGS					
A headboard legs	2¼"	2¼"	33½"	LO	4
B footboard legs	2¼"	2¼"	26"	LO	4
HEADBOARD AND FOOTBOARD					
C rails	¾"	6"	40½"	O	4
D rails	¾"	3"	40½"	O	4
E slats	½"	1½"	17½"	O	30
F slats	½"	1½"	10"	O	30
G spacers	¼"	⅝"	1"	O	112
H spacers	¼"	⅝"	1¼"	O	16
SIDE RAILS					
I rails	1⅛"	6"	76½"	O	4
J cleats	1⅛"	1"	68½"	O	4
K bottom	½"	40"	76⅜"	BP	2

Part	Finished Size T	W	L	Matl.	Qty.
POST CAPS					
L caps	⅝"	2¼"	2¼"	O	16
M supports	¾"	¾"	3⅜"	O	16
N bolt covers	⅜"	1⅛"	4"	O	8
SIDE AND HEAD SAFETY RAILS					
O side rails	¾"	6⅜"	48"	O	2
P headboard rail	¾"	6⅜"	37"	O	1
Q supports	¾"	1½"	10¼"	O	6
LADDER					
R sides	¾"	3½"	64"	O	2
S steps	¾"	3⅜"	12¾"	O	4
T catches	¾"	1½"	9"	O	2

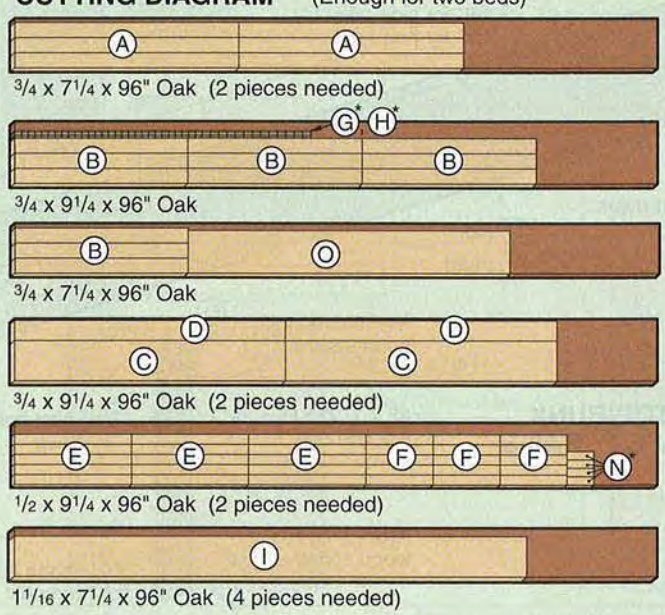
Materials Key: LO–laminated oak, O–oak, BP–birch plywood

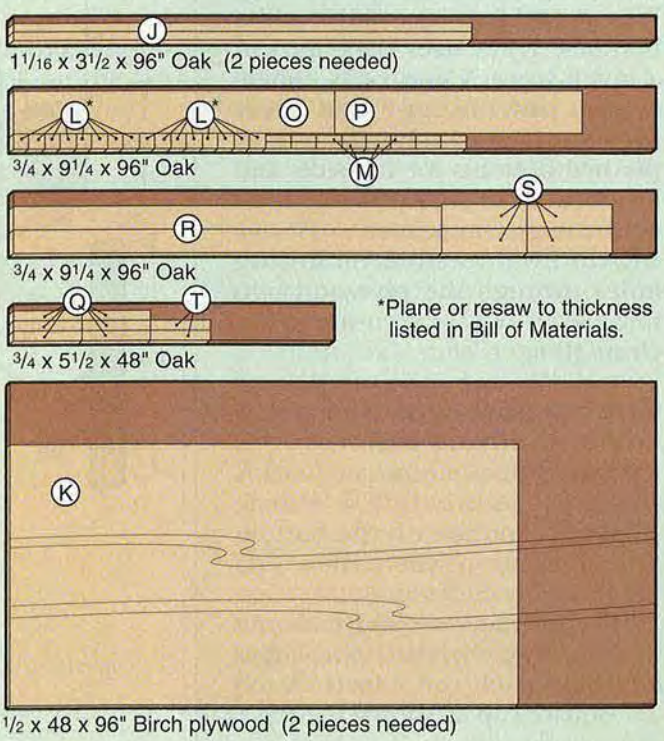
Supplies: 4–⅜" bolts 4" long with ⅝" flat washers and ⅜" nuts, #8×1¼"; #8×1½"; #10×1¼" flathead wood screws, ⅜" dowel stock, 4 pieces of ¾" dowel 6" long for stacking beds, stain, clear finish.





CUTTING DIAGRAM (Enough for two beds)


3/4 x 7 1/4 x 96" Oak (2 pieces needed)
3/4 x 9 1/4 x 96" Oak
3/4 x 7 1/4 x 96" Oak
3/4 x 9 1/4 x 96" Oak (2 pieces needed)
1/2 x 9 1/4 x 96" Oak (2 pieces needed)
1 1/16 x 7 1/4 x 96" Oak (4 pieces needed)



*Plane or resaw to thickness listed in Bill of Materials.

4 Dry-clamp the side rails (I) into the mortises in the headboard and footboard assemblies, checking for square. Using the previously drilled 25/64" holes in each leg as a guide, chuck a twist-drill bit into your portable drill, and drill as far as possible into the tenoned end of each side rail. Then, separate the leg from the side rail, and continue drilling into the tenoned ends of the side rails until the bit goes through the 1" nut-access hole for a 3" total depth.

5 Drill countersunk mounting holes in each cleat (J), clamp them in place, and use the holes as guides to drill pilot holes in the *inside* face of the sideboard rails. Screw the cleats in place.

6 Reinstall the tenoned side rails into the mortised legs. Place a 5/16" washer on each 3/8" bolt (it's a tight fit, but a 5/16" washer does fit onto a 3/8" bolt). Slide a bolt through the hole in the leg and into the hole in the end of the side rail. Fit a 3/8" nut into the nut-access hole, and thread the bolt through the nut, and tighten the bolts until the bed frame is wobble free. Without the 5/16" washer, the head of the bolt will cut into the wood in each leg.

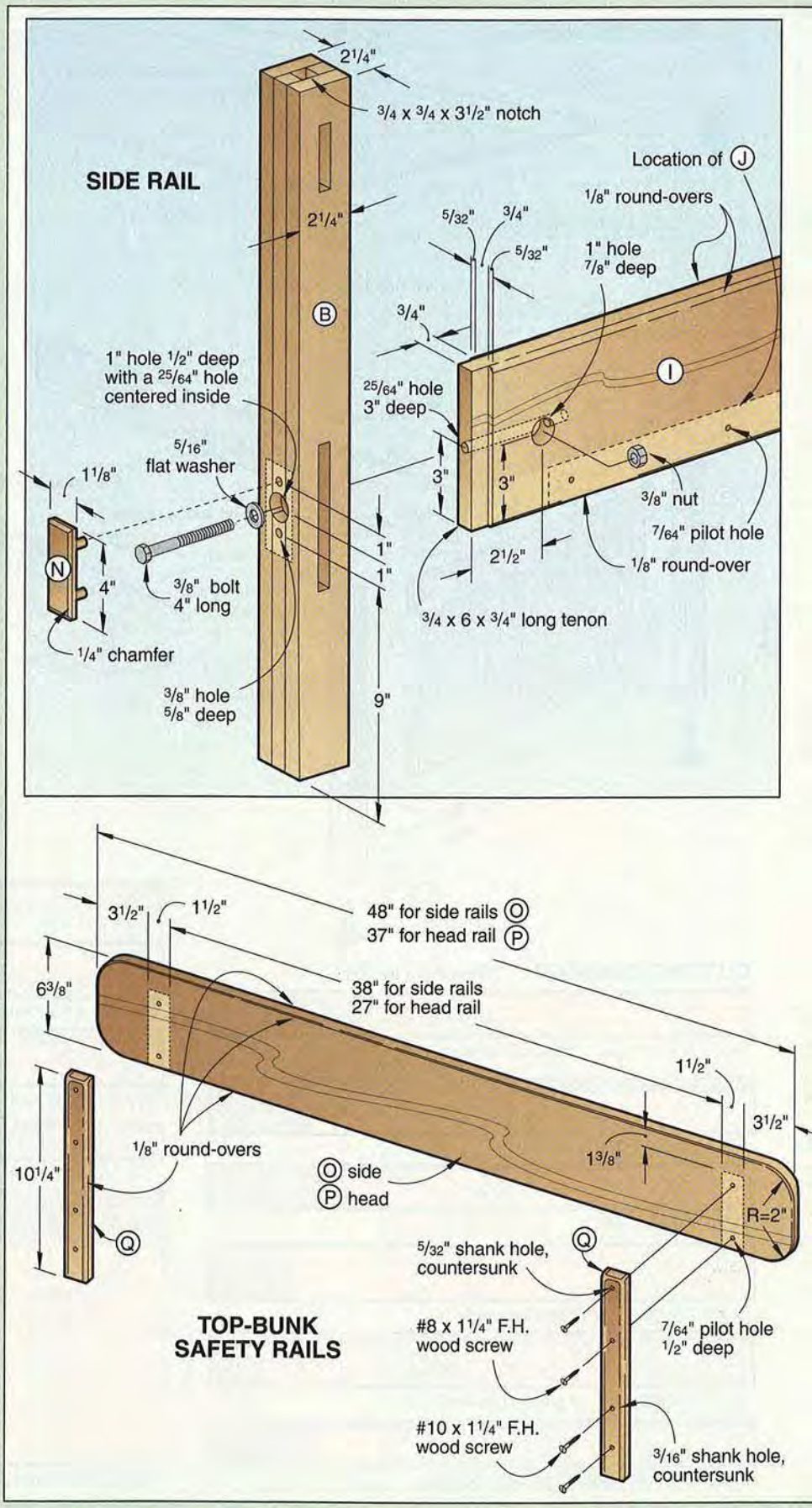
7 From 1/2" birch plywood, cut the bottoms (K) to size. Mark and cut a notch in each corner as dimensioned on the Exploded View drawing. Cut notches in one of the bed bottoms for the side- and headboard-rail supports (Q) used on the upper bunk later.

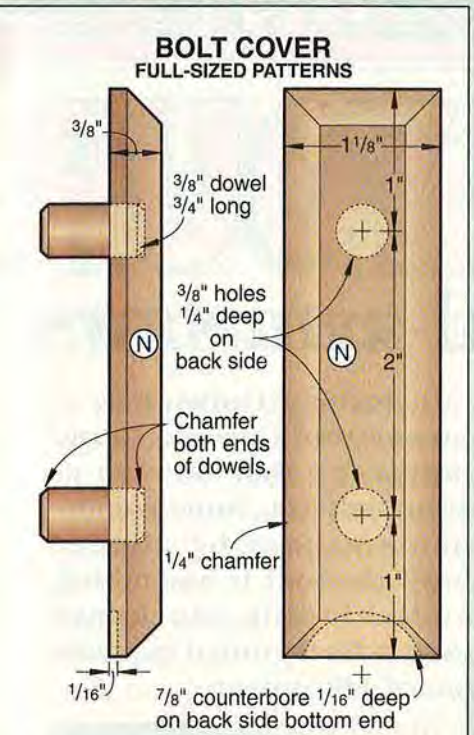
8 Drill countersunk mounting holes through the plywood bottom pieces (K) for securing to the cleats (J) later.

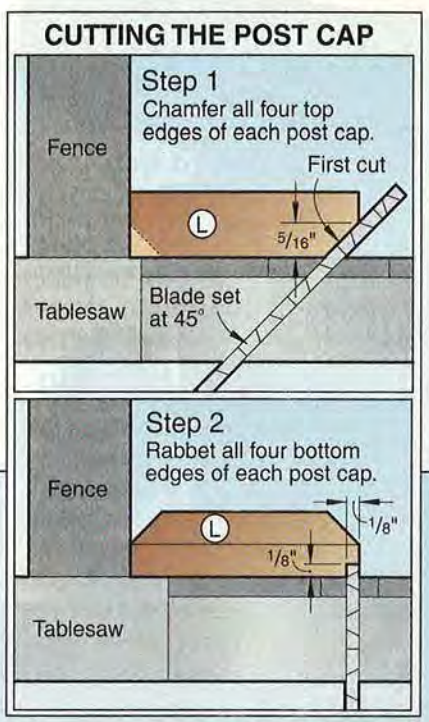
Cut the post caps and bolt covers next

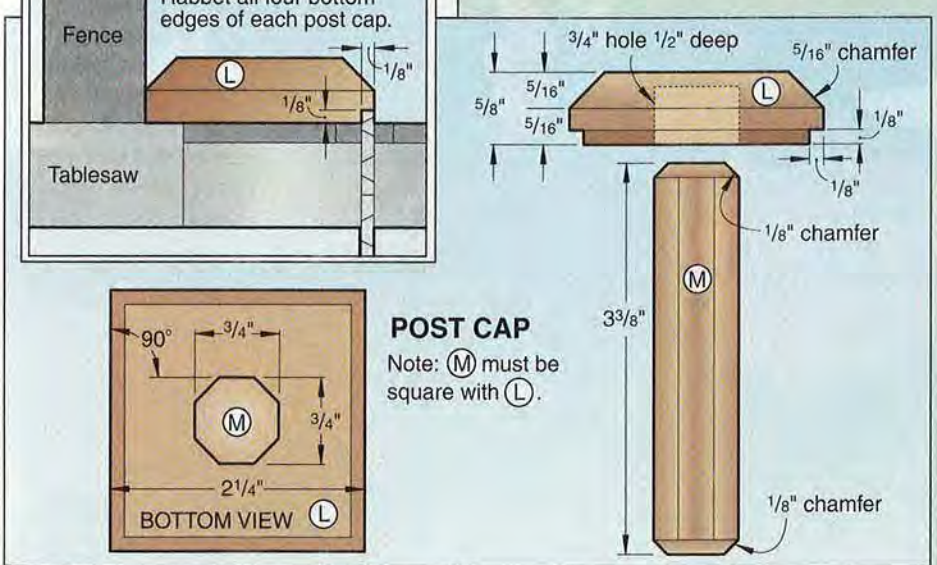
1 From 5/8"-thick stock, cut 16 caps (L) to 2 1/4" square. Drill a 3/4" hole 1/2" deep centered on the bottom side of each cap where shown on the Post Cap drawing.

2 Tilt the blade on your tablesaw to 45° *away from the fence,* and bevel-cut each top edge of each 2 1/4"-square cap as shown in Step 1









of the detail accompanying the Post Cap drawing. Then, follow Step 2 of the detail to cut the decorative rabbets.

3 To make the cap supports (M), cut four pieces of oak to ¾×¾×15". Then, bevel rip each edge of each strip at 45° where shown on the Bottom View accompanying the Post Cap drawing. Check the fit of the octagonal pieces in the mortise holes in the top of each leg. Trim more if necessary until the pieces slide in easily. Crosscut 16 cap supports (M) to 3⅜" long each. Sand a ⅛" chamfer on each end where shown on the drawing.

4 Place a dab of glue in the ¾" hole in each post cap. Then, use a mallet to drive a cap support into the hole. For the caps to fit squarely on the legs later, align the edges of the support square with those of the cap where shown on the Post Cap drawing. You may have to rotate the supports slightly for a proper fit.

5 To form the bolt covers (N), rip and crosscut eight pieces of ⅜"-thick stock to 1⅛×4". Tilt the blade on your tablesaw 45° *away from the fence,* and cut a chamfer on both ends of the bolt-cover blanks, using a wooden extension on your miter gauge to support the piece when making the cuts. See the Bolt Cover full-sized pattern for reference. Remove the miter gauge and use the table-saw fence as a guide when cutting chamfers along the edges.

6 Cut a piece of ½" or ¾" stock to the same size as the bolt covers. Drill a pair of ⅜" holes 2" on center through the stock where dimensioned on the Bolt Cover drawing. Now, use this as a template to position your drill bit, and drill a pair of ⅜" holes ¼" deep 2" on center on the inside face of each bolt cover.

7 Using the same positioning jig, drill a pair of ⅜" holes ⅝" deep, centering the holes over the top and bottom of the bolt holes in the legs. See the Side Rail drawing for reference.

8 Using a ⅞" Forstner bit, drill a 1/16"-deep depression on the back side at one end of each cover where shown on the Bolt Cover drawing. The depression acts as a finger recess when removing the covers from the bed later.

9 Crosscut 16 pieces of ⅜" dowel stock to ¾" long. Chamfer both ends, and glue them into the bolt covers where shown on the Post Cap drawing.

It's time to add the safety rails

Note: *When turning one of the beds over and stacking it on top of the other bed to make a top bunk, you'll need to add a head rail at one end and a pair of side rails to the top bunk to keep children from falling out of bed. You'll also need to rotate the bedrails (I) to keep the cleat (J) along the bottom edge of the rail.*

1 Cut the side rails (O) and headboard rail (P) to size. Mark a 2" radius on each corner, and cut and sand them to shape.

2 Cut the supports (Q) to size. Rout a ⅛" round-over along the edges noted on the Top-Bunk Safety Rails drawing. Using the same drawing for reference, drill mounting holes and screw the supports to the head and side safety rails.

Continued on page 102

WOOD® MAGAZINE'S

TUNING UP YOUR

Part 1: Radial-arm saws,

You just purchased the woodworking machine of your dreams, unpacked its pieces, and bolted everything together. Now you're ready to put this latest addition to your shop through its paces. Well, not quite.

In testing thousands of power tools, we've found only a few that come to us accurately set. Some components cannot be aligned until the tool is assembled, and shipping can knock even a finely tuned machine out of adjustment.

Print this article

GUIDE TO POWER TOOLS

bandsaws, and mitersaws

That's why we always tune up a new tool before using it. We also recheck all of its settings periodically, especially if the machine has been moved or starts turning out inaccurate work.

True, tune-up procedures can be tedious, at least until you get the hang of them. But an untuned power tool won't perform any better than an untuned piano.

The pages that follow show you step by step how to tune radial-arm saws, bandsaws, and mitersaws for accuracy and smoothness. We'll deal with other tools, including tablesaws, jointers, and planers, in a later issue.

The tool tune-up toolbox

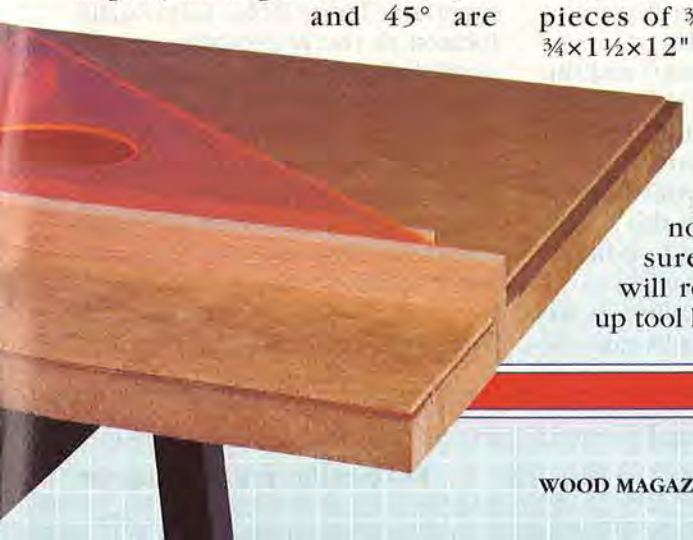
Regardless of the machine you are working with, you must be able to accurately check 90° and 45° angles; all angles between 90° and 45° are usually determined by the accuracy of your 90° and 45° settings.

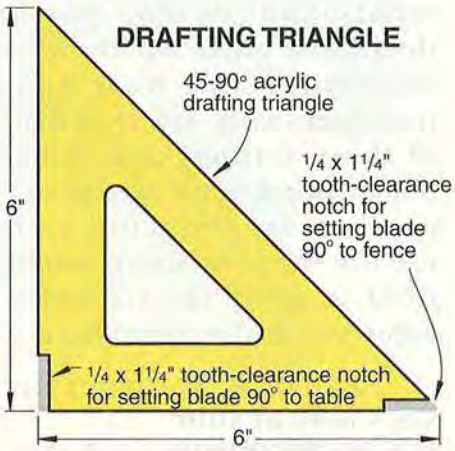
For this article, we set out to find the most precise instruments for setting these angles. To our surprise, we discovered that all you need are a few ordinary drafting triangles, available at any art-supply store. These come in clear, smoke gray, and neon pink and orange colors. The neon hues have a slight edge in visibility, but any color will work.

You'll need 6" and 8" models, and may also want to add a larger 14" triangle for squaring blade tracking on radial-arm saws and mitersaws. We filed notches in our triangles as shown in the illustration *right*, so they will clear the teeth on saw blades.

You probably already own the rest of your tune-up kit. You'll need a 24" aluminum level, a 4' aluminum straightedge, a set of SAE or metric Allen wrenches, and a set of SAE or metric open-end or box wrenches (depending on the type of screws and bolts used on your machine).

For test cuts, lay in several pieces of ¾×3×12" stock and ¾×1½×12" lumber. Rubber cement, a wood screw plug (a ¼×½×½" scrap of wood also works), a playing card, piece of note paper, tape measure, and marking pen will round out your tune-up tool kit.




DRAFTING TRIANGLE
45-90° acrylic drafting triangle
1/4 x 1 1/4" tooth-clearance notch for setting blade 90° to fence
1/4 x 1 1/4" tooth-clearance notch for setting blade 90° to table
6"
6"

First, give your machine a checkup

Whether your power tool is brand-new or has been with you for years, start each tune-up with a thorough mechanical inspection. Before you begin, disconnect the power cord to prevent accidental starts.

Look for loose or missing fasteners, sloppy bearings, sloppy pivot points, and any excess movement of parts that might adversely affect alignment or safety. Apply moderate force to each part, looking, listening, and feeling for movement or play.

Also check the belt and pulleys for cracks, wear, wobbling, looseness, and alignment. A cracked or worn belt should be replaced, as well as pulleys that are badly worn or wobble out of round.

Correct any other problems you find, either with adjustments covered in your owner's manual, shimming, or new parts.

Continued

RADIAL-ARM

Radial-arm saws perform many woodworking feats, but this versatility can also lead to the saw's undoing. Because it has more adjustments and moving parts than most other woodworking equipment, wear and tear eventually knock some of those settings and parts out of alignment. For accuracy's sake, the more you use the saw, the more you'll need to apply the six basic adjustments described here.

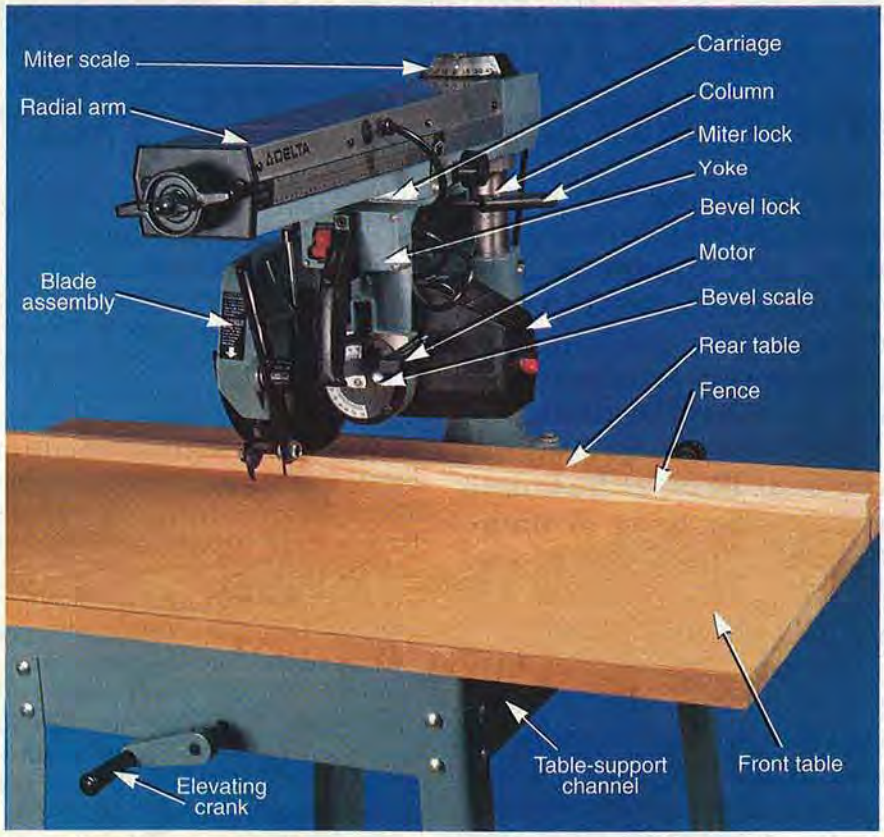
Let's look at your saw's components

If you still have your radial-arm saw's owner's manual, take it out and confirm the elements identified on our anatomy photo *right*. (Locations differ somewhat from one make and model to another.)

All radial-arm saws include a *motor* and *blade assembly* that pivots in a *yoke*. The yoke, in turn, pivots on a *carriage*, which rolls on tracks along the *radial arm*. The arm itself pivots on a *column*, allowing you to make left- and right-hand miter cuts.

An *elevating crank* raises or lowers the arm to adjust the height of the saw blade in relation to the table. *Front* and *rear tables* bolt to *table-support channels*. Sandwiched between the tables is a *fence* that you position workpieces against.

A *miter scale* enables you to set the saw's travel at angles to the fence. You secure the saw with a *miter lock*. A *bevel scale* and *bevel lock* do the same jobs for bevel cuts at angles to the table.



ANATOMY OF A RADIAL-ARM SAW

Tuning your saw by the numbers

Now you're ready to get that saw in tune. Because each of these adjustments depends on the one that goes before it, make them in order—and don't skip a step.

1 Adjust the column

Play between the column and the casting that holds it throws the arm out of alignment, causing sloppy cuts. And a column that binds or vibrates as you crank it up and down to adjust the height of the blade stresses the column and the gears that move it.

First, lubricate the column (we prefer Liquid Wrench because it doesn't attract as much dust as oilier lubricants). To check for play, grasp the end of the arm with one hand and try to lift it. If the column moves front to rear within the support, tighten the pinch bolts that clamp the casting together. These bolts are usually located at the rear of the casting as shown in the *Adjusting the Column* illustration.

Now, turn the elevating crank in both directions. If the column binds, you've overtightened the bolts. Back them off slightly, and test the elevation again. You may need to adjust the bolts several times before you arrive at the point where the column moves

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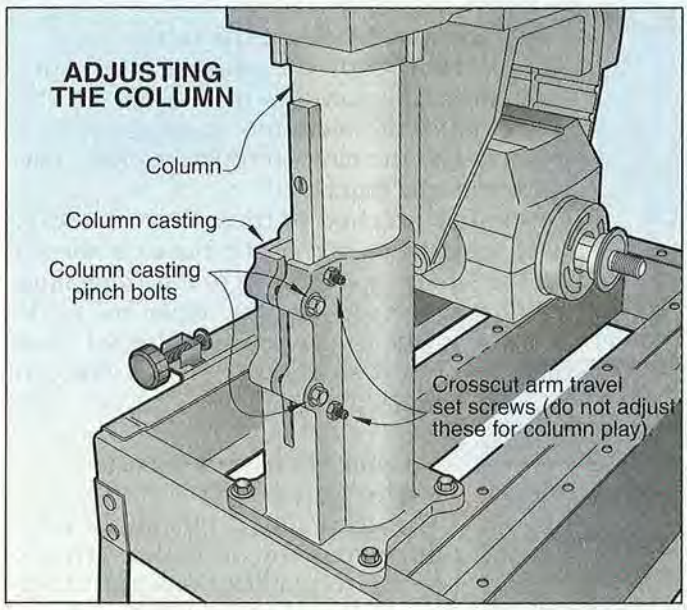
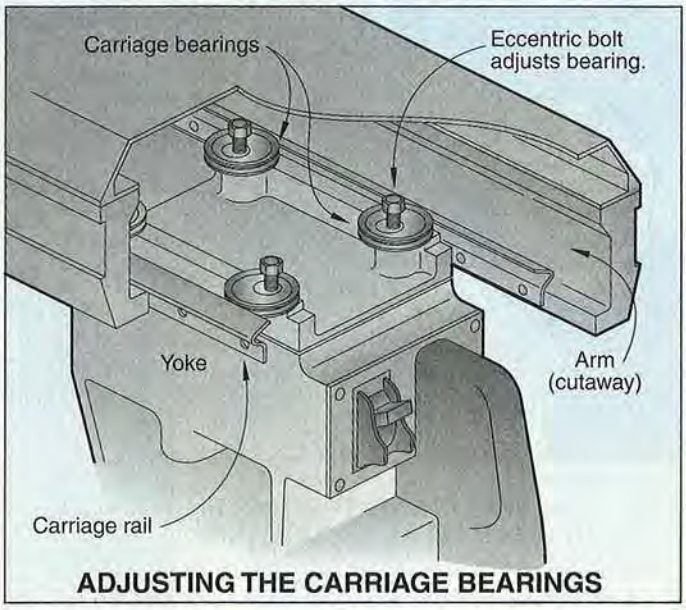
SAWS


ADJUSTING THE COLUMN
Column
Column casting
Column casting pinch bolts
Crosscut arm travel set screws (do not adjust these for column play)



smoothly, with a bare minimum of play. (You'll end up with a slight deflection, caused by leverage that the arm and carriage apply to the column.)

2 Check the carriage bearings

Next, slide the carriage along the arm. It should glide smoothly, with even resistance along the entire length of its travel. If it does not, or if you find up-and-down or side-to-side play in the carriage, the carriage bearings need adjusting.

First, wipe the track and bearings clean and lubricate both, watching out for sharp casting edges. (Liquid Wrench works well here, too.) Carriage bearings are mounted on eccentric bolts as shown *above right*. To remove looseness, rotate these bolts to move the bearings in or out. You may need two wrenches to do it.

Note: *Some saws don't have adjustable bearings. With these, the only way to remove play is to replace the bearings.*

3 Adjust the table parallel to the arm

To ensure that the blade will cut the same depth along the entire crosscut, the table and arm must be parallel to each other. Surprisingly, this adjustment is best made with the table off. Why? Because a particleboard table can absorb moisture and warp, especially if you've cut kerfs into it for cross- and miter-cuts. Trying to check for parallel from an uneven surface will give you poor results.

Take your time with this step; if the table is not set correctly, it will be impossible to accurately set the remaining adjustments.

Begin by removing the tables, fence, blade guard, and blade. Unlatch the bevel lock and rotate the motor until its arbor points straight down. Secure the bevel lock in this position.

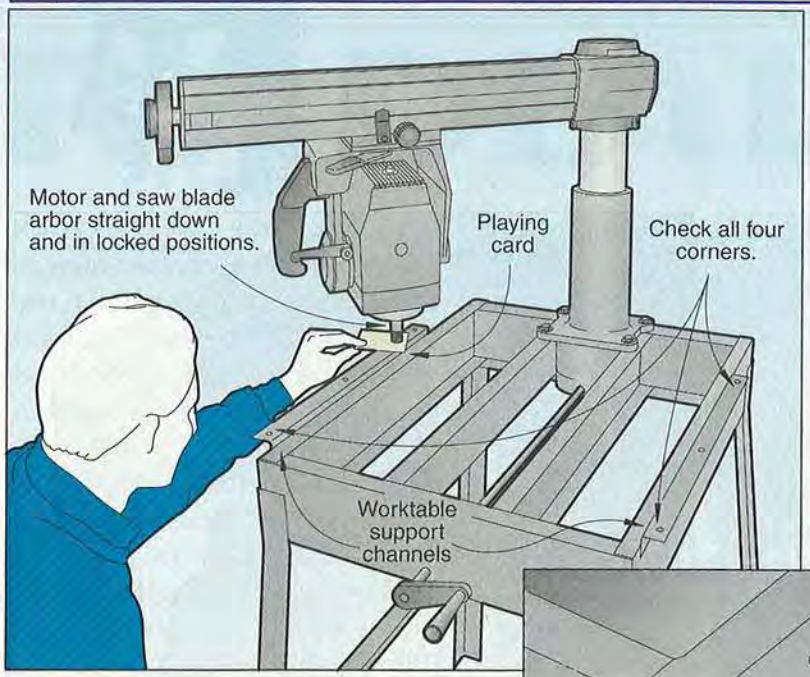
Next, unlock the miter-lock handle, and swing the arm over the left or right table support channel. Position the arbor directly over a bolt hole in the support channel. Lock the motor and carriage in this position and finger-tighten the bolts that secure the support channels to the frame. They should be slightly higher than the frame.

Now, slowly lower the motor until its arbor contacts a feeler gauge or playing card held over the bolt hole, as shown in the illustration at the *top of the next page*. When you can slide the gauge or card back and forth with only slight resistance, snug up the support-channel bolt.

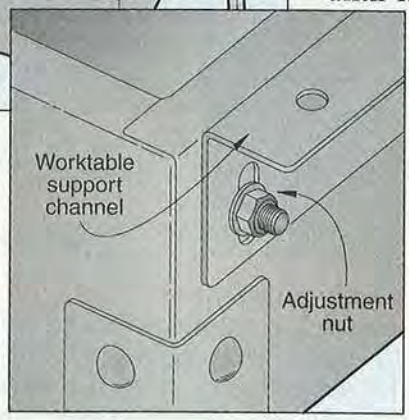
Note: *Lock the saw at this elevation and do not change the setting until both support channels are completely adjusted.*

Repeat the procedure at the other end of the support channel. Tightening the bolts can slightly misalign the support channel, so you may need to go back and forth a few times to get the channel exactly parallel.

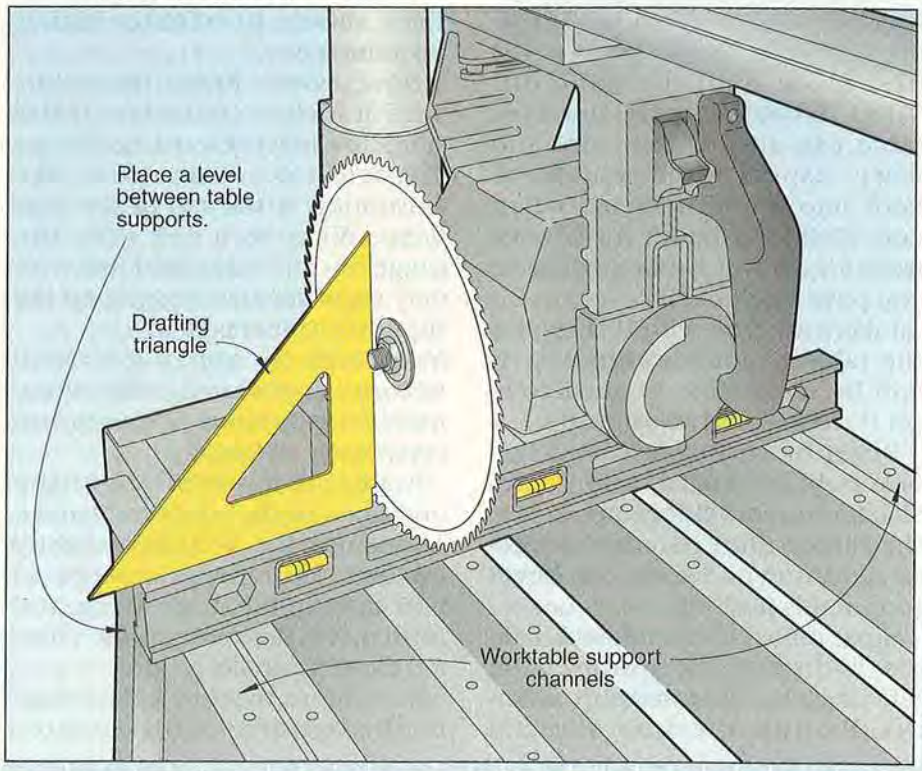
Now, move the arm and carriage to the opposite table support


Motor and saw blade arbor straight down and in locked positions.
Playing card
Check all four corners.
Worktable support channels

ADJUSTING THE TABLE PARALLEL TO THE ARM



SQUARING THE BLADE TO THE TABLE



bracket, and go through the same leveling procedure. Finally, rotate the motor to horizontal, return the arm to 90 degrees, and reinstall the saw blade—but don't replace the table just yet.

4 Square the blade to the table

As we've already mentioned, you can't assume that a table is true, so leave the table off for this step, too. In its place, lay a level across the table-support channels, parallel with the fence.

Set your notched 8" triangle on the level and against the side of the blade as shown in the *Squaring the Blade to the Table* illustration. If you see any gap, adjust the blade until it is 90° to the level, and reset your bevel scale to 0°. Now you can replace the table.

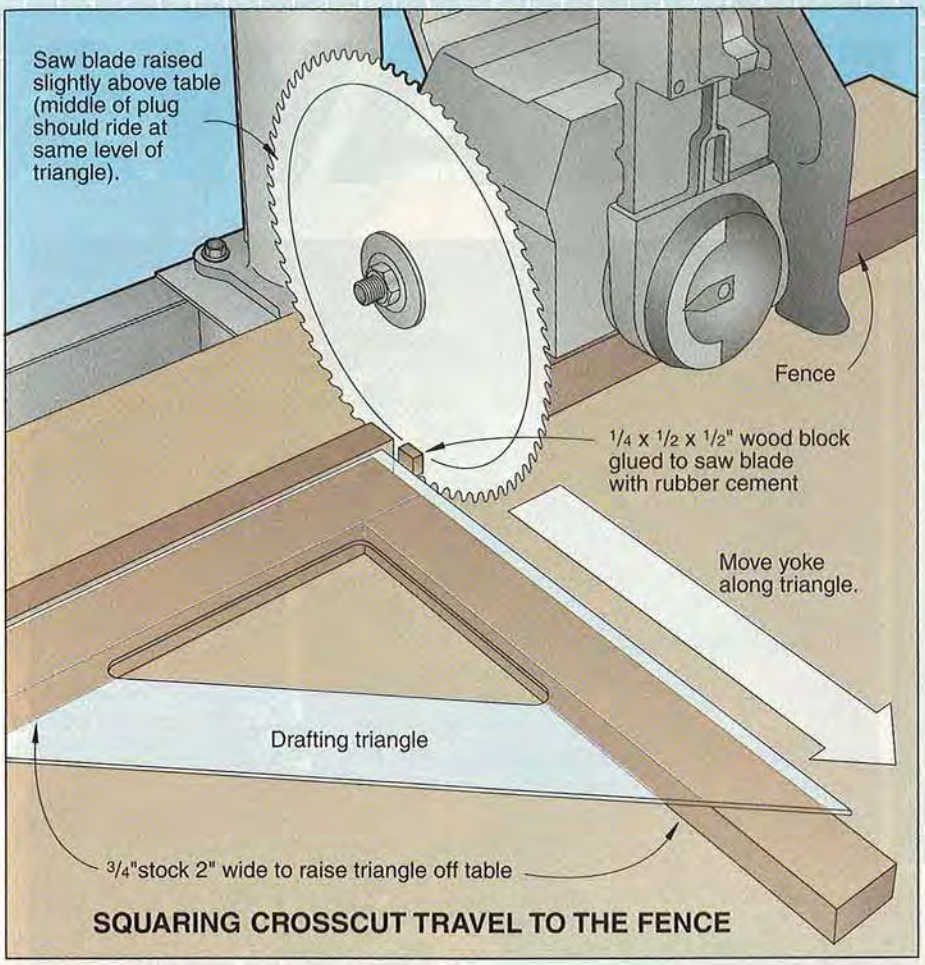
5 Square crosscut travel to the fence

The accuracy of this adjustment depends on a fence that's absolutely straight. Sight along yours. If you see any signs of bowing or twisting, replace the fence.

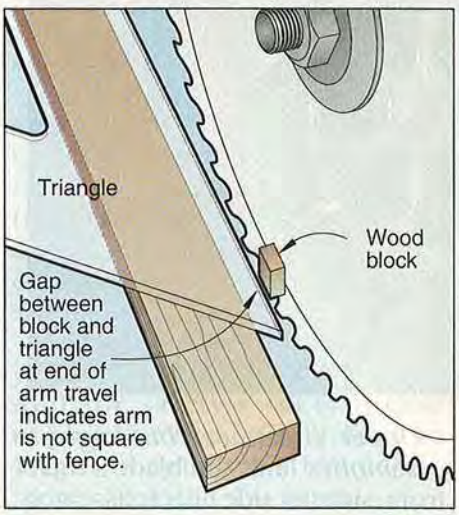
Now, lay out two lengths of 1×2 to elevate the 14" triangle ¾" above the table. Rubber cement a ¼×½×½" scrap of wood or wooden screw hole plug onto the side of the blade just above the teeth as shown *right*. (A small magnet also will work.)

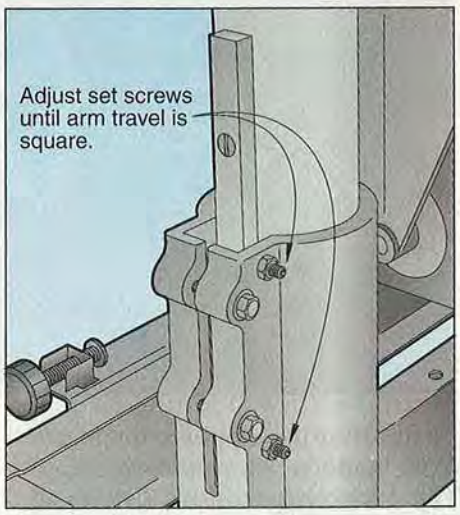
Adjust the triangle so it is flush against the fence and barely touching the wood plug. Very slowly, pull the carriage through its travel. If the plug moves the triangle or moves away from it, adjust the arm as shown *far right*, or as explained in the owner's manual for your saw.

Swing the arm to 45°, then return to 90° and recheck. Replace the guard. Now remove the triangle and 1×2s, plug in the saw, and crosscut a 12"-wide piece of plywood. Check its edge against the triangle. When you are satisfied that the crosscut is square to the fence, reset the miter scale to read 0°. Unplug the saw again.


Saw blade raised slightly above table (middle of plug should ride at same level of triangle).
Fence
1/4 x 1/2 x 1/2" wood block glued to saw blade with rubber cement
Move yoke along triangle.
Drafting triangle
3/4"stock 2" wide to raise triangle off table

SQUARING CROSSCUT TRAVEL TO THE FENCE





Note: *To learn how to check the 45° miter setting, see* Check the miter settings *on page 81.)*

6 Correct blade heel

Heeling occurs when the blade is not parallel to the motor's line of travel. Heeling causes rough cuts, splintered edges, and kickbacks.

To check for heeling, clamp the level to the fence, then hold the 8" triangle firmly against the level and the side of the blade. The triangle must contact the entire side of the blade. If you see a gap at the front or back of the triangle, the blade is heeling. Adjust it as explained in your owner's manual. Check this adjustment often.

Table talk

In testing saws for this article, we ran into a common problem with radial-arm saws: Once kerfs have been cut into the particleboard worktable, it absorbs moisture and begins to warp.

To find out if that's happened in your shop, check your saw's table by laying a straightedge or long level across it. If you find warpage, replace the table and protect it with an auxiliary table. (A few coats of varnish on the top and bottom of the table will help keep moisture out.)

To make an auxiliary table, cut panels of ¼" plywood or tempered hardboard to fit behind and in front of the fence, and stick them down with rubber cement. Now you can cut your kerfs in the auxiliary table without penetrating into the main table beneath it. And when the auxiliary table wears out, just peel it up and install a new one.

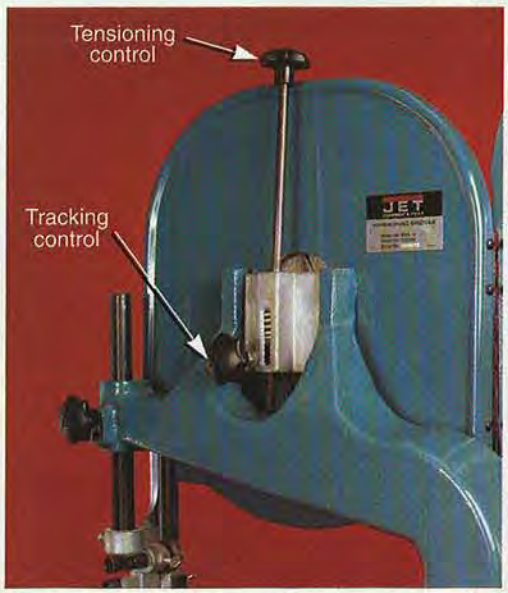
Upgrade your blade

If you're tuning up a new radial saw for the first time, replace the inexpensive blade that came with the saw. You won't get accurate readings (or cuts) with a cheap blade. For 10" saws we recommend buying a quality, carbide-tipped blade with 60 or 80 teeth. Several manufacturers make blades with tooth geometry specifically designed for use on radial-arm saws.

Continued

TUNING UP YOUR POWER

BANDSAWS



Just six simple procedures can transform a chattering, wandering, hard-to-control bandsaw into a machine that truly sings. Sure, you can coax adequate performance out of a saw in the short term by tinkering with minor adjustments, but overstressing the blade, bearings, and wheels leads to major repairs down the road.

Inside your bandsaw: the parts that make it tick

The cutting edge of a bandsaw consists of a continuous, welded-steel *blade* that rotates around an *adjustable wheel* up top and a *drive wheel* below the saw's table. (Some large-capacity bandsaws have a third wheel below.) *Tires* on the wheels cushion and help protect the blade.

Adjusting the upper wheel controls blade tension and tracking. The *tensioning control* (see *inset* photo) raises and lowers the wheel; a *tracking control* on the back of the saw—often called the *tilt knob*—tilts the wheel ever so slightly, causing the blade to move slightly from side to side on the wheel.

Upper and *lower blade-guide assemblies* limit the blade's travel from side to side. Each assembly controls lateral movement with a set of *guide blocks*; *thrust bearings* limit rearward travel when you push a piece of wood into the blade.

Table-lock knobs help you tilt the table to any angle between

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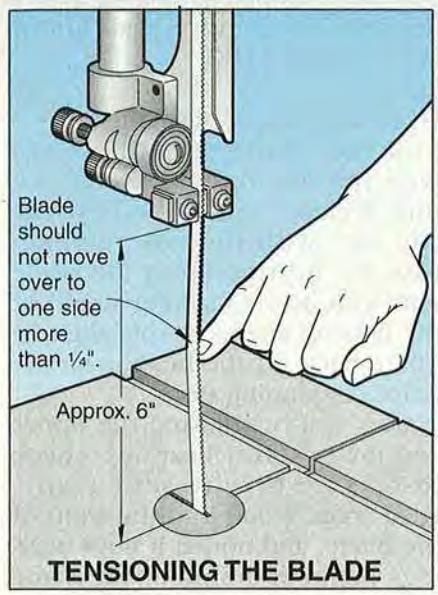
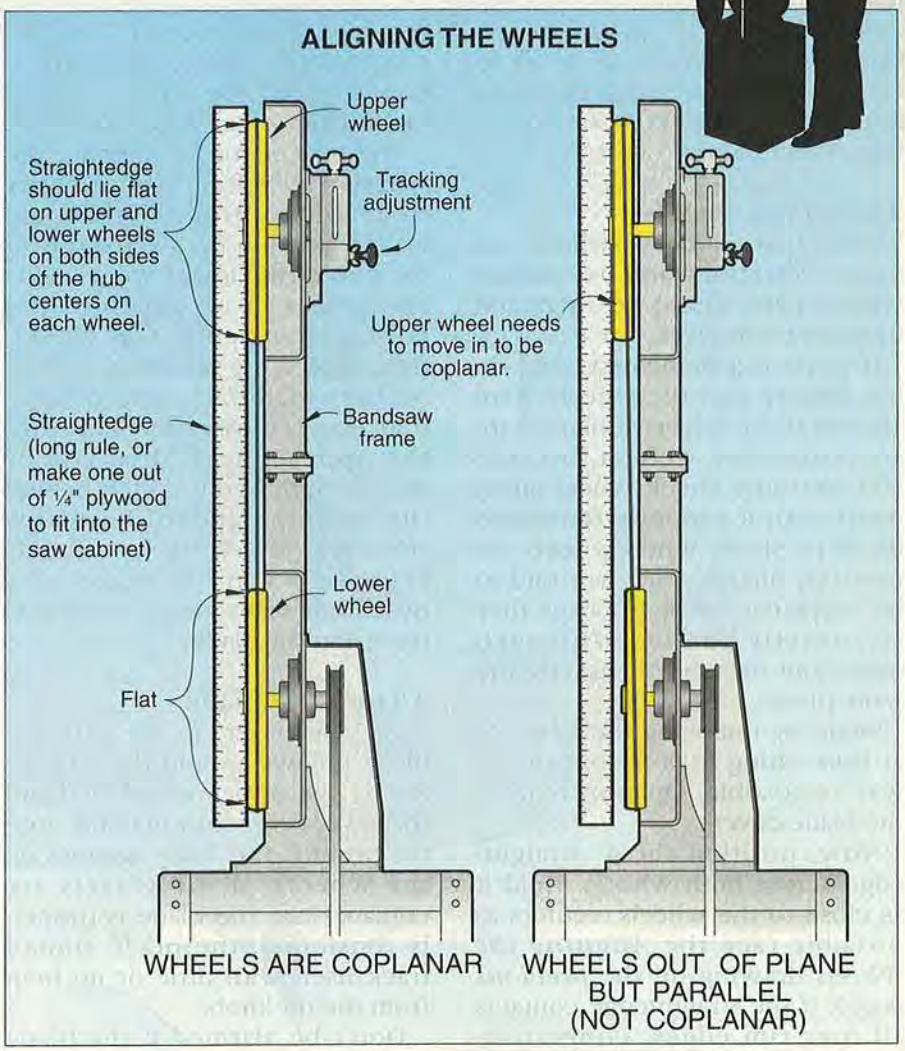


TENSIONING THE BLADE


ALIGNING THE WHEELS
Upper wheel
Straightedge should lie flat on upper and lower wheels on both sides of the hub centers on each wheel.
Tracking adjustment
Upper wheel needs to move in to be coplanar.
Straightedge (long rule, or make one out of ¼" plywood to fit into the saw cabinet)
Bandsaw frame
Lower wheel
Flat
WHEELS ARE COPLANAR
WHEELS OUT OF PLANE BUT PARALLEL (NOT COPLANAR)

90° and 45°. A *table stop* makes it easy to return the table to exactly 90° time after time.

A few preliminaries

Before you begin a bandsaw tune-up, inspect the entire machine, as explained on *page 69*. Pay special attention to the tires, the wheel, and the thrust bearings; replace any components that are badly worn.

Also check to be sure the wheels aren't out of round or wobbly. Clamp a reference pointer about 1/16" away from the tire and spin the wheel by hand. If the gap opens and closes, the wheel is out of round and the wheel or its tire should be replaced.

Finally, install the biggest blade your saw can handle, usually ½". And for safety's sake, please unplug the saw. You'll need to plug it in again for a few adjustments. We'll tell you when.

Six steps to a smooth-running bandsaw

1 Check blade tension

An under-tensioned blade will make sloppy, wandering cuts. Over-tensioning strains the blade, wheels, bearings, and shafts, and can even bend the saw's frame—in much the same way an archer strings a bow.

Most of the adjustments that follow depend on a properly tensioned blade, so let's first make sure yours is right on the money. If it's equipped with a tension gauge, check to be sure the gauge indicates no more than ½ to 1 blade-width higher than the blade on the saw. To verify a gauge's accuracy, or tension a saw that doesn't have a gauge, check the tension by applying firm pressure against the side of the blade with your little finger, as shown in the *Tensioning the Blade* drawing. If the blade moves more than ¼", the blade is under-tensioned.

You also can literally "tune" the blade. First, release the tension entirely, and disengage the guide blocks and thrust bearings from contacting the blade. Pluck the blade and you'll hear a dull fuzzy tone. As you crank up tension, continue strumming. The sound will rise in pitch and improve in clarity. When you reach the clearest tone, the blade is properly tensioned; if the sound begins to diminish as you tighten, the blade is over-tensioned.

After you've tensioned the blade, make a mark somewhere on the tensioning mechanism so that you

Continued

can consistently return to the same tension; you may need to release and retension three or four times before completing the wheel-alignment process.

2 Align the wheels

Wheels that are out of whack can cause vibration, and accelerate wear on the thrust bearings and the tires themselves.

If yours is a brand-new saw, do not assume that the wheels were aligned at the factory. Chances are good that they weren't, because you can only check wheel alignment with a properly tensioned blade in place. When wheels are precisely aligned, they are said to be "coplanar," which means they are exactly parallel with each other and located on exactly the same plane.

Begin by removing the table, or at least tilting it as far out of the way as possible. Open or remove the blade covers.

Now, position the 4' straightedge across both wheels. Hold it as close to the wheels' centers as possible (see the *Aligning the Wheels* drawing on the *previous page*). If the straightedge contacts all four rim edges, congratulations—your wheels are coplanar.

More likely, the straightedge will touch only two or three of the edges, and you will need to spend some time aligning the wheels.

First, you need to get the wheels parallel. To do this, tilt the top wheel until the straightedge contacts both edges of either the top or bottom wheel.

Next, note the gap at the wheel which no longer contacts the straightedge. Continue tilting the top wheel until the gap under the straightedge is equal at both the top and bottom of the non-contact wheel.

The wheels are now parallel, and you will need to move one or the other of them in or out the distance of the gap to make them coplanar. (If the gap measures more than ¼", see *page 78*.)

The procedure for aligning the wheels varies from manufacturer to manufacturer. With some makes, you loosen a set screw at the hub of the lower wheel, slide the wheel in or out until it's coplanar with the top wheel, then tighten the set screw.

Other manufacturers require that you remove the blade and the upper wheel, then add or remove shims on the shaft behind the wheel. Standard hardware store washers work just fine as shims—or you can make your own from sheet metal. Install and retension the blade.

3 Track the blade

"Tracking" refers to the path the blade follows around the wheels. Rotate the upper wheel by hand for several revolutions and note the position the blade assumes on the wheels. If the wheels are coplanar and the blade is properly tensioned, the blade should track itself with little or no help from the tilt knob.

Don't be alarmed if the blade tracks toward the front of the wheel slightly. It needn't track dead center, only in a straight and consistent line.

Continue turning the upper wheel by hand until tracking stabilizes, using the tilt knob to adjust tracking slightly if needed. Then replace the wheel covers and table. Plug in the saw, and jog its switch on and off several times. If the blade continues to track properly—and it should, if you've done everything right up to this point—bring the saw up to full speed.

Don't be surprised to observe that the tracking shifts slightly under full power. As long as it doesn't move more than about 1/32" you're still OK.

4 Set the thrust bearings

You can adjust thrust bearings with the saw running or off; we find it easier to set the bearings "by ear" with the saw running. Ease the bearing up to the blade until you hear a clicking sound or the bearing begins to spin slightly. Then, back off the bearing so the noise or spinning stops.

After you've adjusted the upper and lower thrust bearings, check to be sure they're set equally. Feed some wood into the front of the blade, and notice if both bearings begin spinning at the same time. If not, readjust one bearing or the other.

5 Adjust the guide blocks

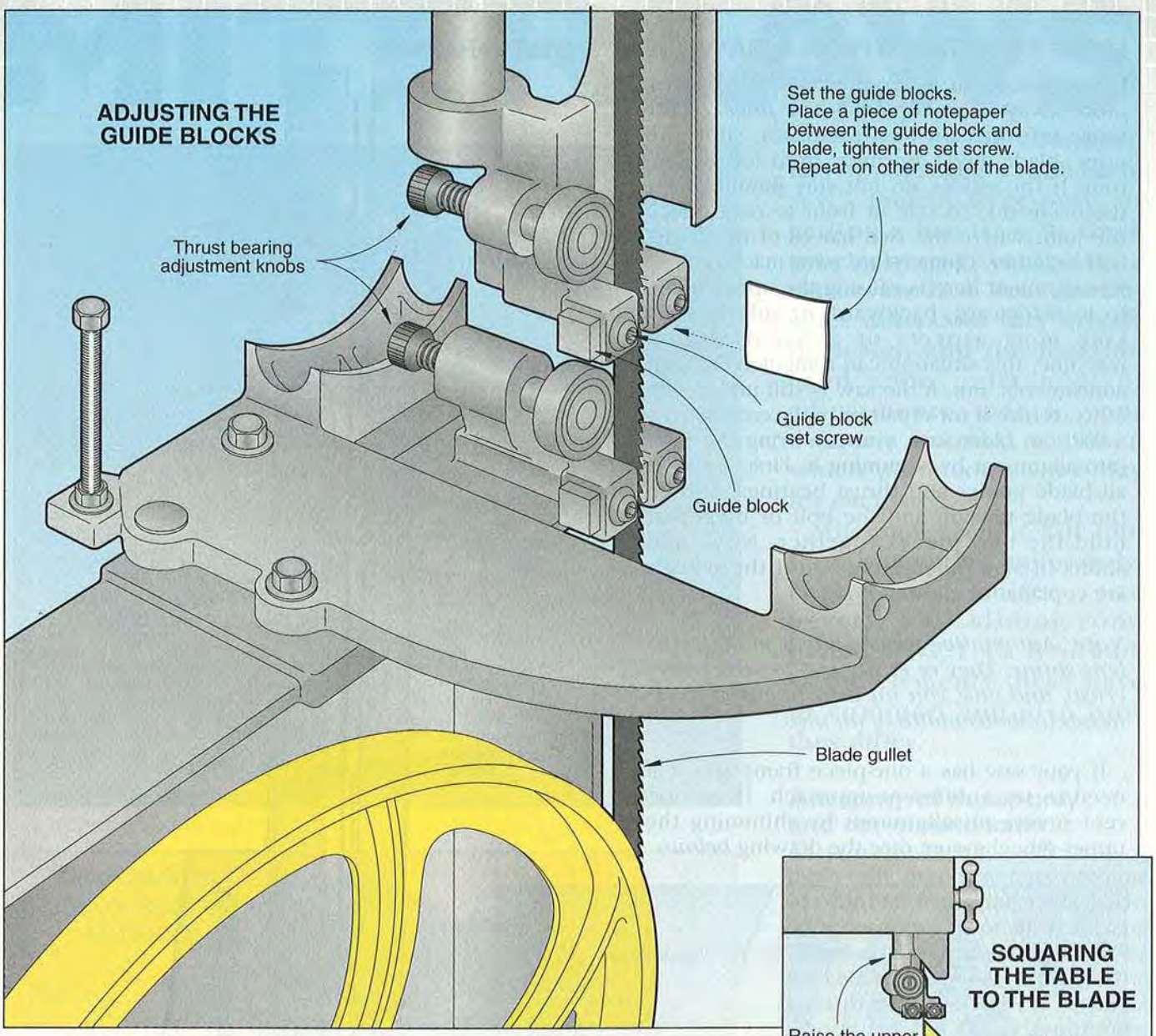
Guide blocks are best adjusted with the saw not running, so unplug the saw. Set the upper blocks, then the lower ones.

First, adjust the guide-block assemblies in or out so that the guide blocks come just up to the gullets of the blade's teeth. Make sure the guide blocks do not contact the teeth under cutting loads.

To set guide-block clearance easily and accurately, we use a strip of note paper as a thickness gauge. Start with the upper left block. Loosen its set screw, slip the paper between the block and blade as shown *right*, and nudge the block up against the paper and blade. Take care that you don't deflect the blade.

The clearance is right (about .0025") when you can move the paper with very little resistance. Leave the paper in place and lock the guide. Repeat the process with the upper right block and another strip of paper.

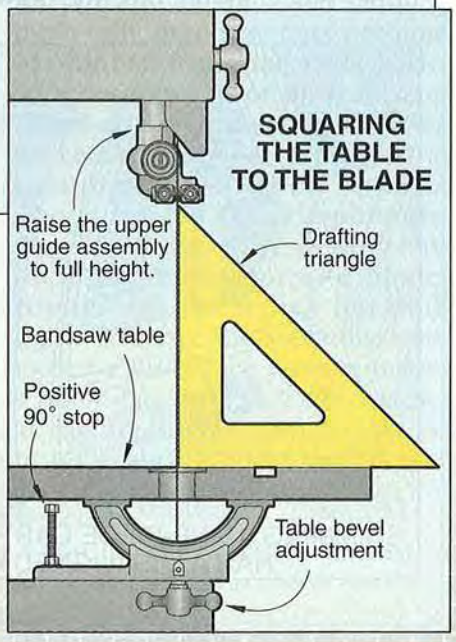
You'll soon get proficient at setting the upper blocks, because they should be readjusted every


ADJUSTING THE GUIDE BLOCKS
Set the guide blocks. Place a piece of notepaper between the guide block and blade, tighten the set screw. Repeat on other side of the blade.
Thrust bearing adjustment knobs
Guide block set screw
Guide block
Blade gullet

time you move the guide assembly up or down. Use the same technique to set the lower guides. They're more difficult to get at, but you need to readjust them only when you change blades or the blocks become worn.

6 Square the table to the blade
Use a 6" triangle to determine if the blade and table meet at 90°. If they don't, loosen the table bevel adjustment locks and move the table until you can see no gap between the triangle and blade as shown in the illustration *right*.

If you can't square the table with the locks, the table stop underneath is probably set too high. Lower it a turn or two. After you've squared the table and locked it in place, raise the stop until it contacts the table. Reset the miter scale to 0°.


SQUARING THE TABLE TO THE BLADE
Raise the upper guide assembly to full height.
Drafting triangle
Bandsaw table
Positive 90° stop
Table bevel adjustment

Continued

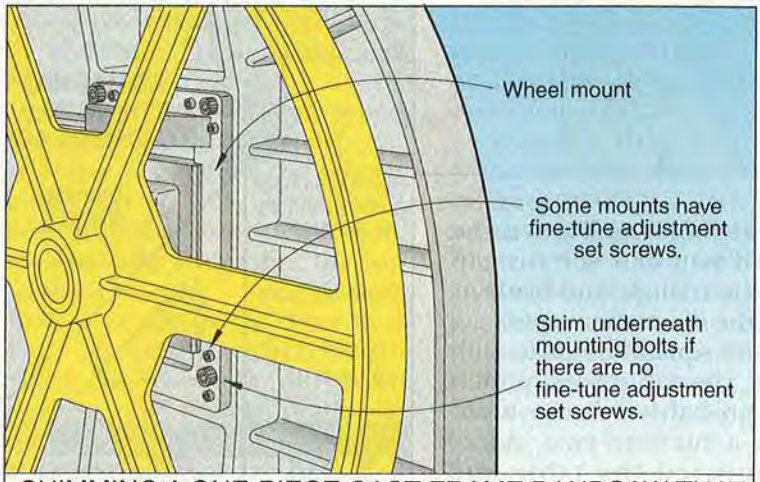
HOW TO STRAIGHTEN A SAW THAT'S OUT OF LINE

If the wheels in a two-piece saw are ¼" or more away from coplanar (see *page 76* for more information on this topic), slide the upper-blade guide assembly from top to bottom. If the guides do not stay parallel with the blade side to side or front to rear, check the joint where the two halves of the frame bolt together. Chances are poor machining or misalignment here is causing the upper frame to lean forward, backward, or side to side. Like most aspects of a woodworking machine, this situation can remedied through adjustments. But, if the saw is still under warranty, return it for repair or replacement.

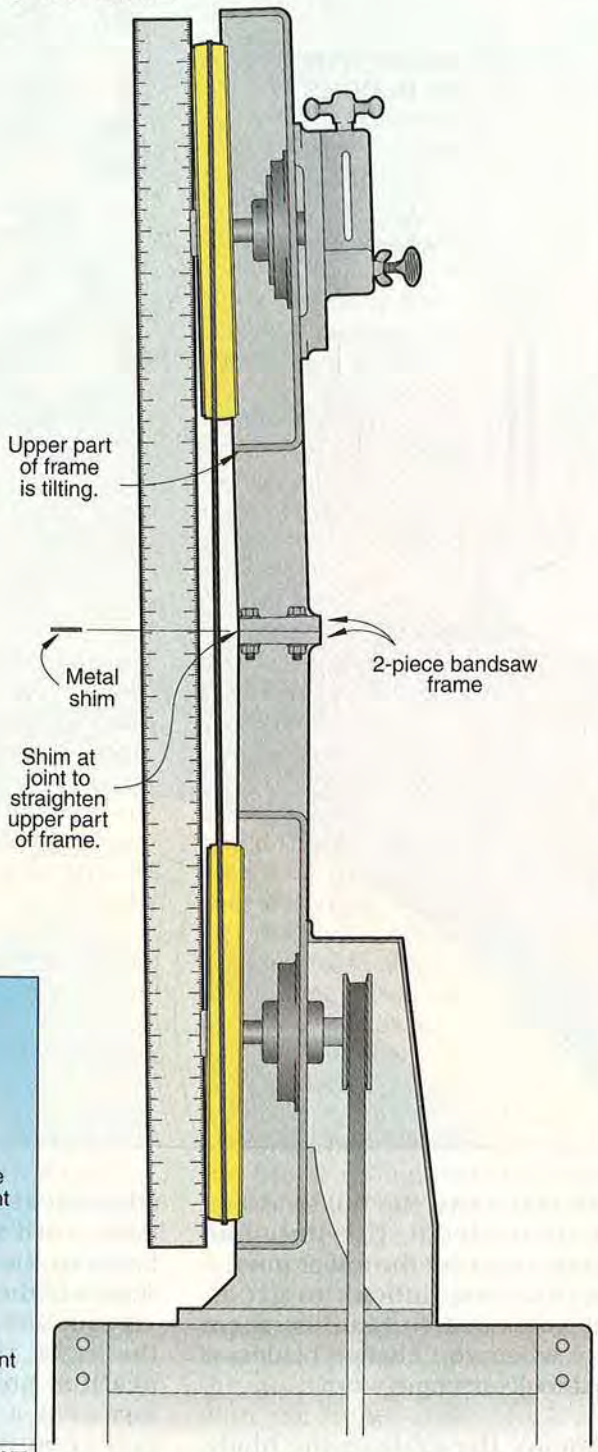
With an older saw, you can bring the joint into alignment by shimming it. First, back off all blade guides and thrust bearings. Loosen the blade tension and the bolt or bolts that hold the two pieces together. Now, add shims in small increments until the wheels are coplanar or close to it.

Note: *Automotive feeler gauges make excellent shims. They're easily cut to size, won't crush, and give you an assortment of thicknesses in thousandths of an inch.*

If your saw has a one-piece frame you will need to try a different approach. Here, correct severe misalignment by shimming the upper wheel mount (see the drawing *below*).

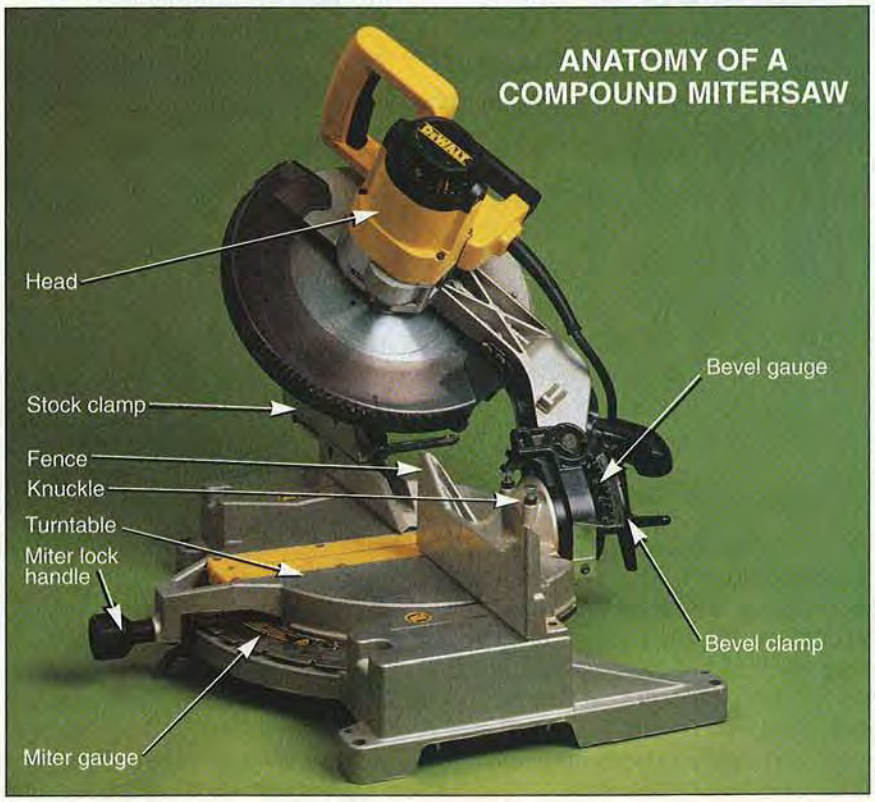

Wheel mount
Some mounts have fine-tune adjustment set screws.
Shim underneath mounting bolts if there are no fine-tune adjustment set screws.

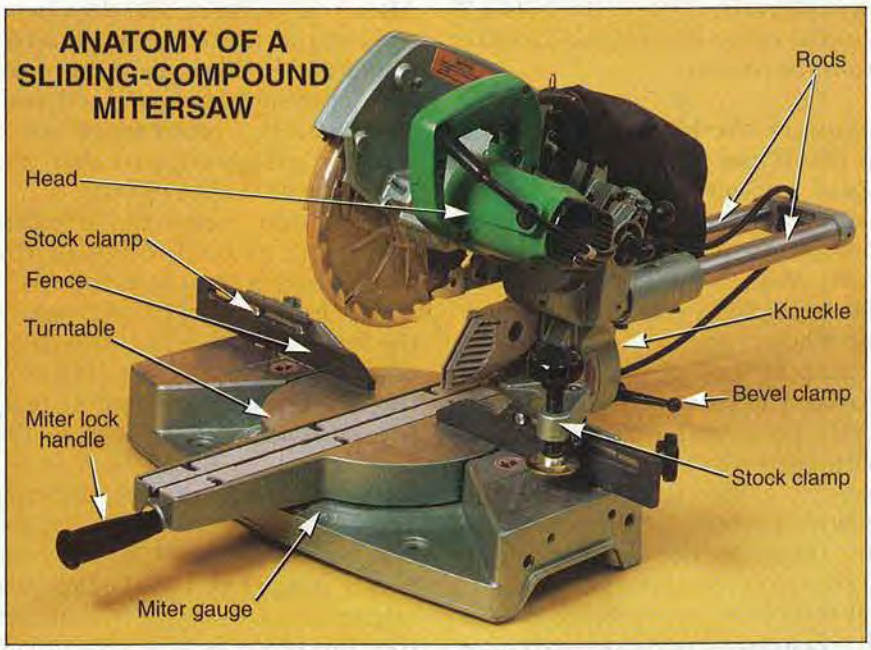
SHIMMING A ONE-PIECE CAST-FRAME BANDSAW THAT HAS A MISALIGNED WHEEL MOUNT



SHIMMING A MISALIGNED TWO-PIECE FRAME

MITERSAWS





Compared to the complexities of adjusting a radial-arm saw's multitude of parts or getting a bandsaw to track precisely true, tuning up a mitersaw is a breeze. But since mitersaws vary greatly in design and the location (and even existence) of adjustments, turn to your owner's manual to learn which parts come into play for each step.

Mitersaw designs fall into three categories: miter-only, compound (miter and bevel), and sliding-compound saws. Let's first look at the elements these have in common and also how they differ.

Anatomy of miter-only and compound saws

As you might have guessed, a miter-only mitersaw cuts nothing but miters. Being the most basic of mitersaws, all of its parts are found on a compound mitersaw, so refer to the Anatomy of a Compound Mitersaw photo *above left* for the components discussed here. A *head* that includes the motor and blade rotates 45° (or more) left and right. To move the assembly, you loosen a *miter lock handle*, move a *turntable,* then lock the handle at the angle you want to cut. A *miter gauge* at the front of the saw indicates the angle you've selected.

You lay the work up against a *fence.* For safe, precision work, a *stock clamp* secures the wood to the fence or table.

Print this article

Continued

Compound mitersaws also have a head that rotates just like a miter-only saw does. But the head on a compound saw also tilts up to 45° to the operator's left for cutting bevels. The head tilts on a *knuckle* located at the back of the saw. To tilt the head, you loosen a *bevel clamp*, select the bevel angle you want on a *bevel gauge*, then retighten the bevel clamp.

Anatomy of a sliding-compound saw

This one has all the features of a compound saw. And because the head slides forward, crosscutting capacity increases to 10" or 12". As shown in the photo on the *previous page*, the head moves along one or two *rods*.

Five settings spell accuracy

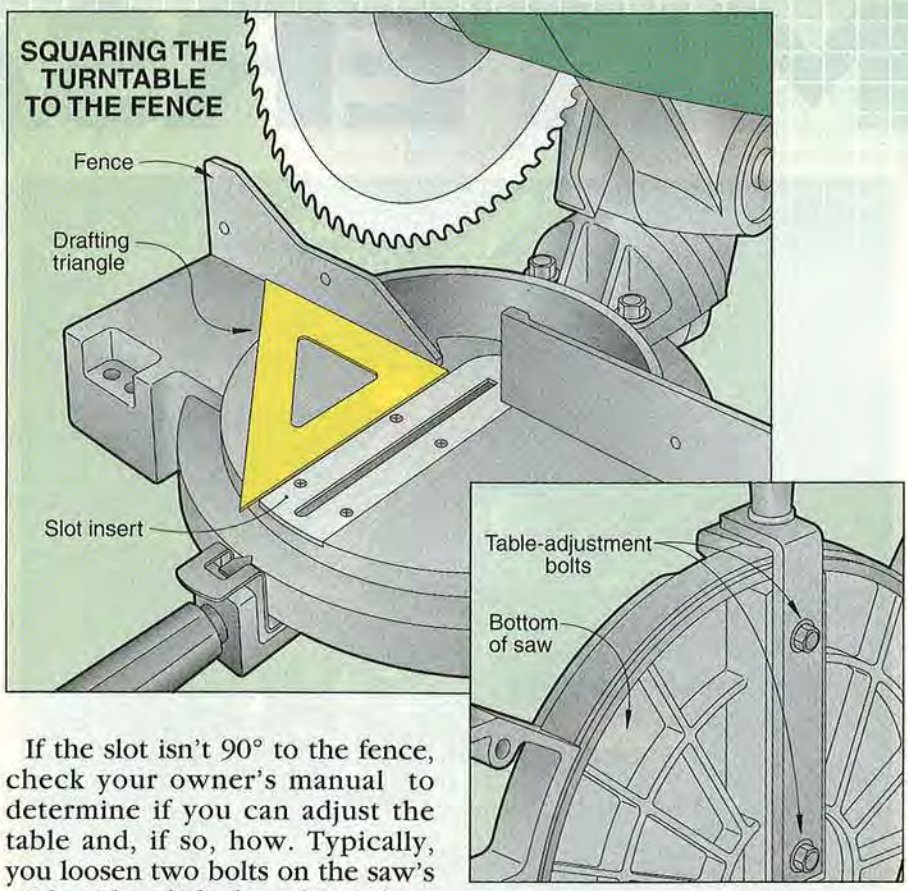
Five simple settings (you may have to perform several of them more than once) will have your mitersaw singing with perfect pitch. But first, for accurate, clean cuts, equip it with a quality blade. We recommend a 60- or 80-tooth carbide-tipped model.

Also, if your saw doesn't have a stock clamp, get one—and use it. A piece of wood that you merely hand-hold against the fence can shift slightly, which will affect the accuracy of your test cuts. And, as with any power tool, unplug your mitersaw's power cord before making these adjustments.

1 Square the turntable to the fence

Unless the slot in the turntable is at exactly 90° to the fence when the miter scale is set to 0°, you're not going to get accurate cuts at any angle.

To check this adjustment, lock the table at 0°. Lay a 6" triangle flat on the table with one edge against the left-side fence. Align the other 90° side of the triangle with the table slot as shown in the drawing *above*.



If the slot isn't 90° to the fence, check your owner's manual to determine if you can adjust the table and, if so, how. Typically, you loosen two bolts on the saw's underside, shift the table left or right, and tighten the bolts.

Note: *Not all saws include this adjustment. Those that don't should come preset for square from the factory.*

2 Square the blade to the fence

Again, consult your owner's manual or closely examine the saw to learn how to make this adjustment. With some saws you move the head; with others, you move the fence or table.

Begin by locking the head in the down or transport position. Again lay a triangle on the table with one edge against the left-side fence. Align the other edge against the body of the blade, not the teeth as shown in the *top* drawing on the *opposite page*.

If the blade is misaligned, locate the fasteners provided for this adjustment, and loosen them only enough to move the part required to square the blade to the fence. After you've reset the alignment, tighten the fasteners and double-check with the square to make sure nothing has moved. (If your saw has a two-piece fence, use a level or straightedge to align the right side as shown *right*.)

If you don't see a gap at either the front or back edge of the blade, make a test cut as follows:

Plug in the power cord, unlock the head, and lay a 1×2 with its ¾" edge against the fence. Position the board for a cut about 4" from the end, and secure it with the stock clamp.

After you make the cut, use a triangle or square to check that the end cut is exactly 90° to the edge If it's not, check and reset the alignment. Once you're satisfied that the blade is perfectly square

to the fence, unplug the saw and proceed to the next step.

3 Square the blade to the table

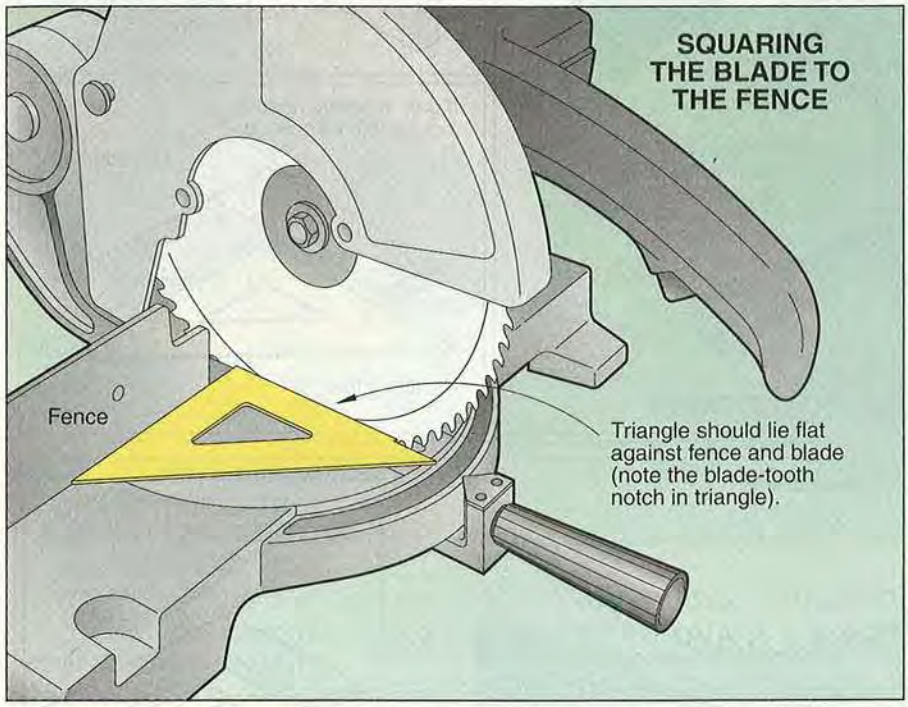
If yours is a miter-only saw, this adjustment may not be possible. With other saws, check the owner's manual to locate the adjustment points, which are typically situated at the base of the column as shown in the *Head Adjustment* illustration.

Position the turntable at the 0° setting, and lock it in place. Place a 6" triangle with one edge flat on the table and the other vertically against the body of the blade, not its teeth, as shown on the *next page.*

Look for any gaps between the blade and the edge of the triangle. If you don't see any, the blade is 90° to the table. If you spot a gap at the top or bottom, loosen and adjust or shim the column base to bring the blade to a perfect 90° angle to the table.

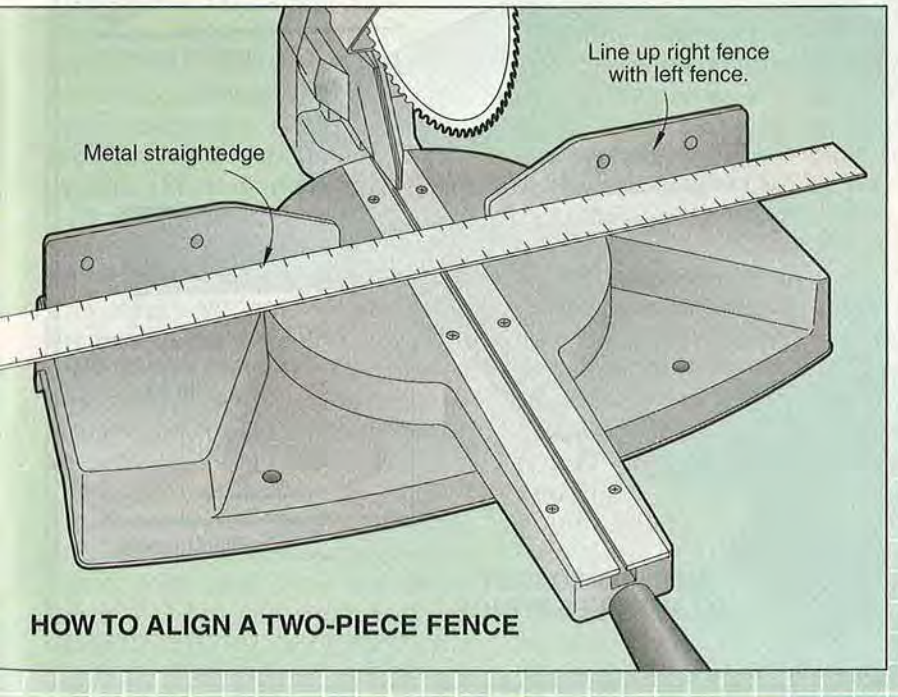
Now, you're ready to plug in the saw and make a test cut. Clamp a 1×3 to the table, with its ¾" edge against the table. Start the saw. After it's up to speed, make a cut. Remove the board and use a triangle or square to determine if the end cut is at 90° to the ¾" edge.

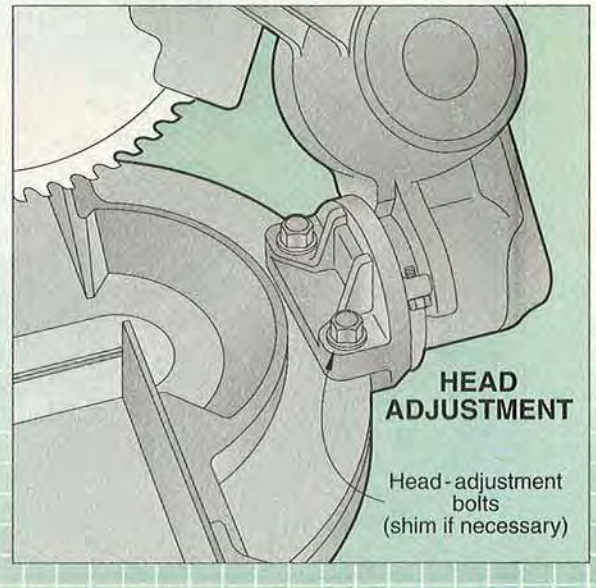
If the cut is accurate, repeat the cut in Step 2 to ensure that the blade is still square to the fence. The cuts in Steps 2 and 3 must be at perfect 90° angles before you proceed to Step 4.


SQUARING THE BLADE TO THE FENCE
Fence
Triangle should lie flat against fence and blade (note the blade-tooth notch in triangle).

4 Check the miter settings

You probably can't do much about your saw's miter settings because only a few manufacturers provide adjustments for changing the distance between positive stops. If your saw flunks these tests, you either must compensate





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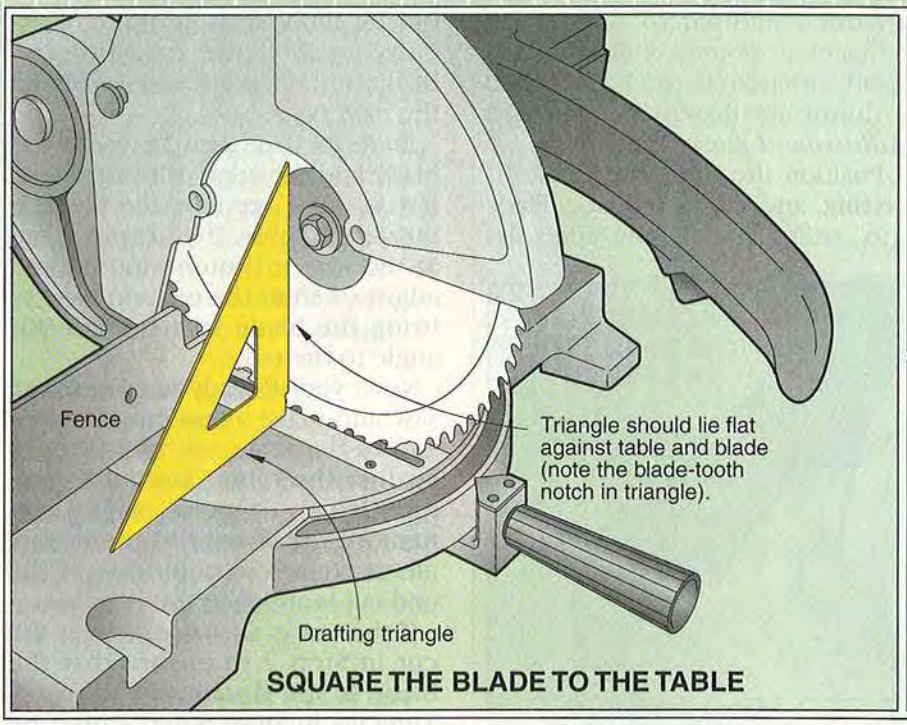
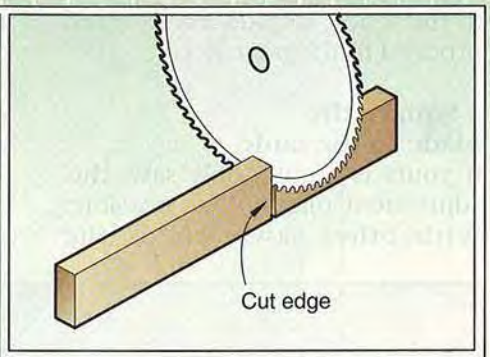
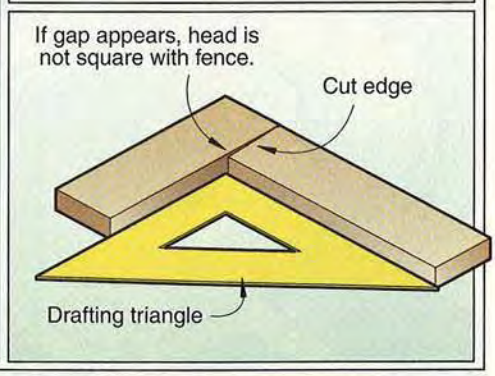
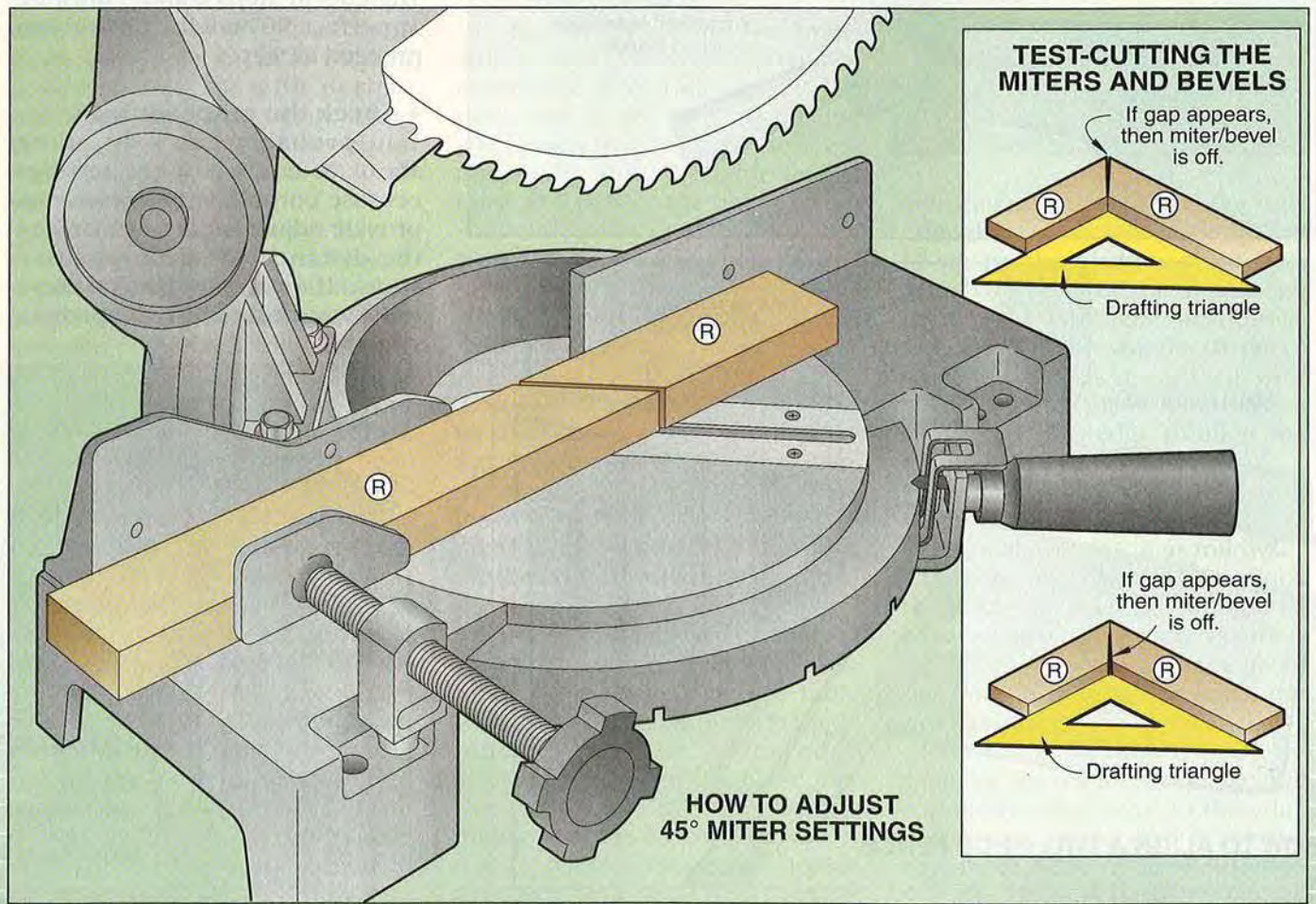


SQUARE THE BLADE TO THE TABLE

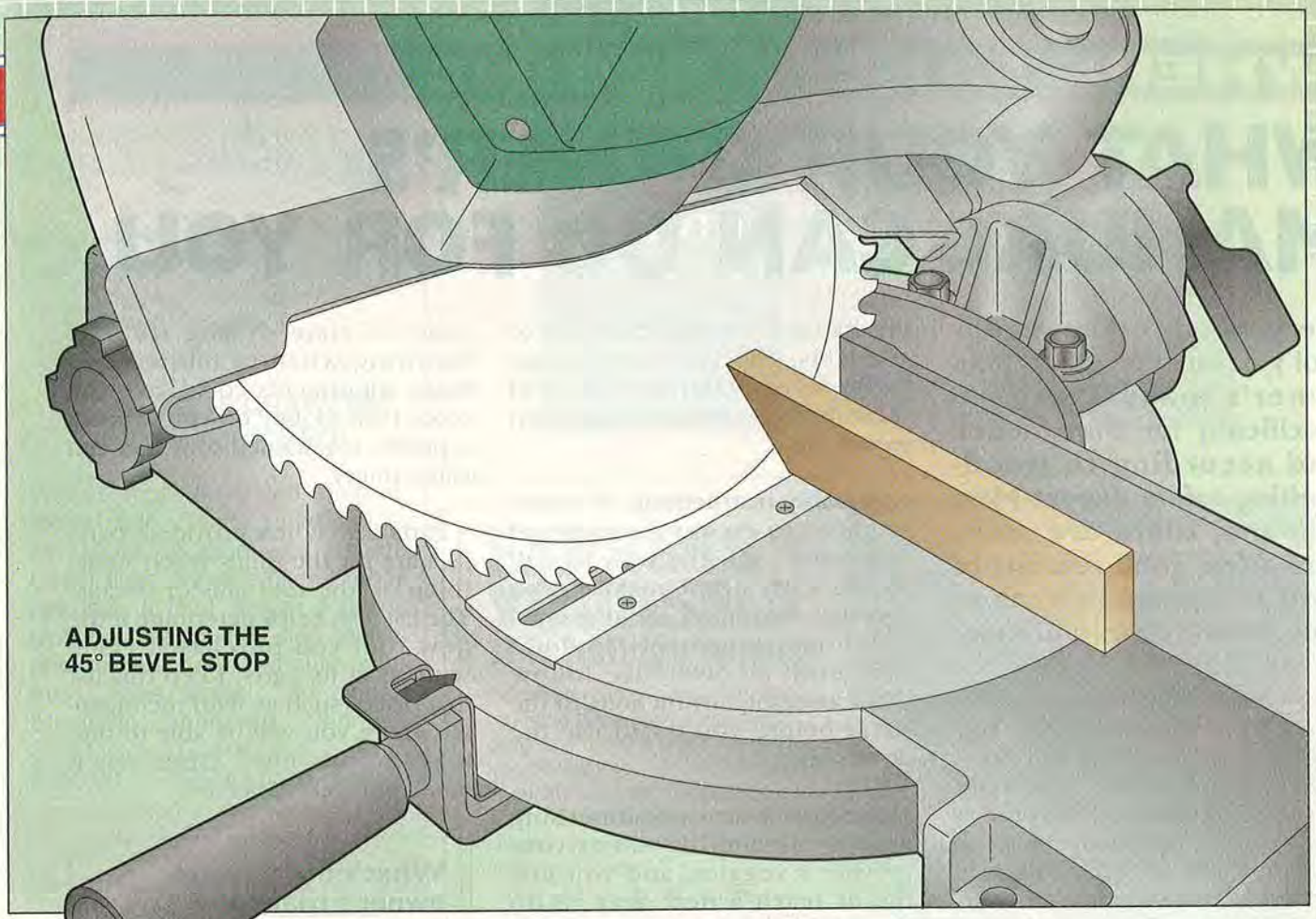






HOW TO ADJUST 45° MITER SETTINGS

TEST-CUTTING THE MITERS AND BEVELS



for any variance or return the saw for repair or replacement.

Mark one test board with an R at each end and the other with an L. Move the table to the right 45° setting, and lock it down. Clamp the stock marked with Rs to the table and make a cut, lowering the blade slowly to ensure accuracy. (See the drawing *left.*)

Remove the two pieces, and rotate one so that when the two 45° angles are placed together they form a 90° angle as shown in the inset drawings *left*. Check this with your largest triangle or square. Any discrepancy from square is exactly double the amount the miter stop is off.

Now, move the table to the left miter mark, and make another cut. By laying the test pieces on top of each other, you can determine if both the right and left miters are off by the same amount. If the errors are mirror image, recheck Step 2; the blade may not be adjusted exactly square to the fence.

If all the previous steps check out at 90°, the stop slots were probably not machined properly at the factory. To compensate for this, place pieces of tape over the scale, find the right settings by trial and error, and mark the tapes at those settings. Unplug the saw again for the next step.

5 Adjust the bevel stop

Compound and sliding-compound mitersaws require one more adjustment—setting the 45° bevel stop. With the exception of the Makita LS1211 12" sliding-compound saw, which tilts both left *and* right for bevel cuts, compound mitersaws tilt in just one direction—to the left.

We've found that the reduced clearance between the table and blade makes it difficult to use a triangle for this step. Instead, use one of the accurate test pieces from Step 4 as a setting gauge. Just lay it on the table as shown *above*, with the miter against the open side of the beveled blade. Consult your owner's manual to find the bevel stop-adjusting mechanism, and align the blade with the miter.

Plug in the saw and make a test cut. Clamp a board to the table, with its 3"-wide face against the fence. After you make the cut, put the two 45° angles together to make a right angle, and check this with a triangle or square.

Just as in Step 4, any error in this angle is double the bevel-stop error. Repeat the test cuts until you get a perfect 90° angle. Finally, set the miter and bevel pointers to 0 degrees. Your saw should be miter perfect!

Written by Jim Hufnagel
with Bob McFarlin and Dave Henderson
Illustrations: Kim Downing
Photographs: King Au

WHAT YOUR OWNER'S MANUAL CAN DO FOR YOU

Every woodworking power tool you buy comes with an owner's manual written specifically for that model. And according to woodworking safety expert Mike Gililland, there are more than a few good reasons to read it thoroughly, then keep it handy for reference.

All owner's manuals have at least one thing in common: They provide basic information. But don't think that you needn't read it just because the material covered is basic. The manual happens to be the manufacturer's only chance to speak to you, so taking a few minutes to listen will be worth your while. Generally, here are the *must-read* parts of every owner's manual you'll ever see:

•**Safety tips.** Count your fingers. Want to keep them all? Safety tips normally come first in the manual, and they're often repeated later on. Why so much about safety? Because most users never take a course in the proper use of the tool; they just learn it "on the job." Frequently, that means learning bad habits that can lead to accidents. The safe way may not be the way you learned it. So read these before anything else, then reread them.

•**Assembly instructions.** If you're required to do any assembly of your new tool, the how-to will appear early in the manual. You also may find notes about maintenance and alignment. So don't wait until all else fails; follow these assembly instructions to the letter before you try to use the new tool.

•**Use tips.** Learning something new is as good for you as your mother's veggies, and you just might learn a new way to do something. At the very least, you will learn the recommended way to do basic operations. For instance, do you know when to plunge with your plunge router and when not to? And how about when not to use your tablesaw rip fence? Go ahead, test yourself on these points now.

•**Maintenance tips and instructions.** It's a good idea to look through this section *before* you actually use the tool—and from time to time during its life. Knowing when to lubricate or make adjustments could save you more than money down the road; a poorly maintained tool also can cause injury.

• **Parts list.** When provided, parts lists are for the times when something on the tool fails or breaks. The list also helps determine if the new tool you purchased came with all of its parts. Keep this list in a place (such as with the manual) where you will be able to find it years from now. That's when you'll most likely need it.

What's not in your owner's manual

Don't expect an owner's manual to be an encyclopedia on the tool. The manufacturer who publishes your manual is the best authority on the tool, but the ways to perform many specialty operations vary. So the greatest thing that a manufacturer can do is to cover the basics right. To expand your woodworking horizons, read other books and magazines like this one. Above all, remember, for a special operation that you want to do and don't know how, study first and cut later.

Mike Gililland, PE, CSP

Mike Gililland is a lifelong woodworker and an engineer with 25 years' experience designing power tools, writing manuals and instruction labels for tools, and generally working to make tools safer. He has served as an engineering-lab supervisor for a chain-saw manufacturer, a director of product development for a lawn-equipment producer, and the director of product safety for a major line of woodworking power tools. A resident of Missouri, he owns and operates a safety-consulting firm.

Readers, if you have a safety-related question you'd like Mike to answer, just write with a SASE, stating it simply, to: The Safety Man, WOOD® Magazine, 1912 Grand Ave., Des Moines, IA 50309-3379. Not all questions received will be published, but each will receive a reply.

Photograph: Ann Gililland

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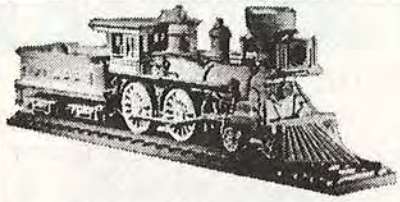

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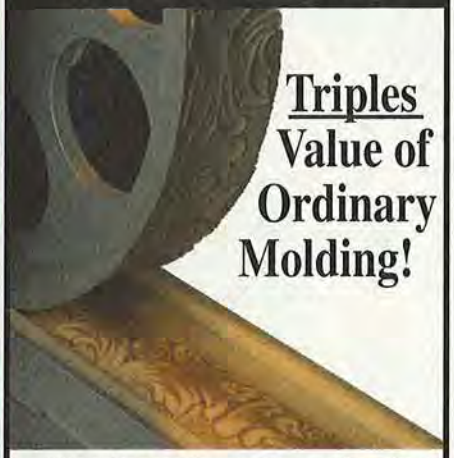

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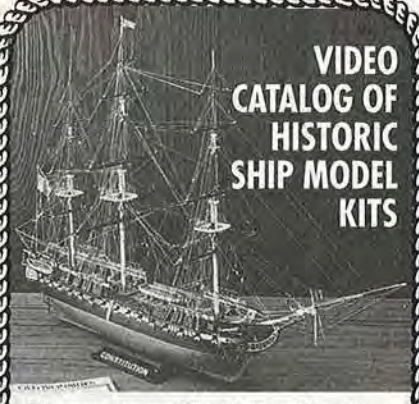

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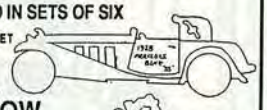

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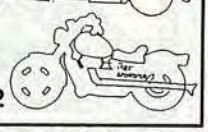

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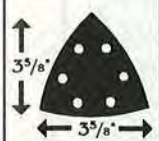

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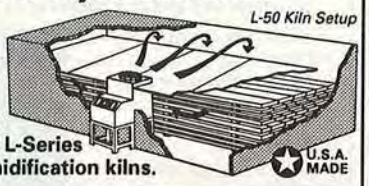

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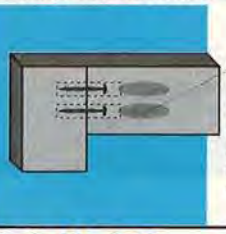

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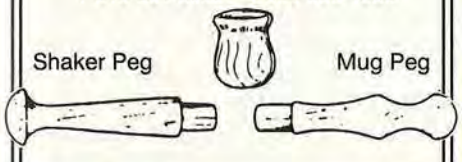

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Fairest of them all

Continued from page 53

ting depth to 5/16". Rabbet the back of each frame member, making several shallow passes to reach the full 3/8" width.

3 Miter-cut the frame sides, top, and bottom to the finished length shown. The rabbeted edges go toward the inside of the assembly.

4 With the drill press and the bit used to drill the uprights, drill 3/8"-deep mounting holes in the frame sides. Center a hole on the width and length of each side.

5 Assemble the frame, glue, and clamp. Check for squareness by measuring the diagonals.

6 Cut the mirror back (I) from 1/4" plywood. Test its fit inside the rabbeted frame opening.

7 From 1/8"-thick stock, rip the stops (J, K) to width, but make them slightly longer than the lengths listed. Miter-cut them to finished length, then drill and countersink 7/64" shank holes where shown on the Exploded View drawing.

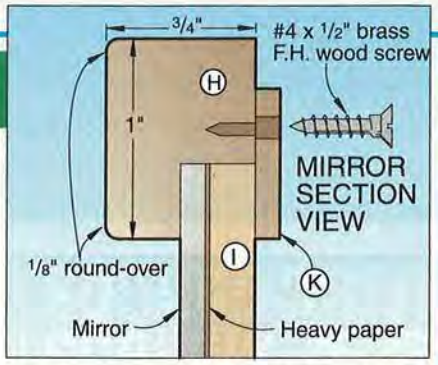
8 Position the stops on back of the frame assembly. Hold them in position with double-faced tape while you drill 5/64" pilot holes for #4×1/2" flathead brass wood screws. Number the stops for position, then remove them from the frame.

9 Cut two 13/16" lengths of 3/8" dowel rod. These pivot pins will join the frame to the uprights.

Put it all together

1 Sand the base, uprights, frame, back, and stops with progressively finer grits from 100- to 320-grit. Do not sand the uprights' tenons or the pivot pins.

2 Finish all parts and assemblies. (We applied two coats of Minwax Antique Oil Finish, taking care not to get any on the uprights' tenons or in the base's mortises.) Since the pivot pins will not be glued, you can finish them. Allow the finish to dry.



3 Buy a piece of 3/32" (single-strength) mirror about 1/8" shorter and narrower than the inside of the rabbeted frame opening. Refer to the Mirror section view, and install the mirror, a same-sized piece of heavy kraft paper (the side of a grocery bag would be great), the back (I), and the stops.

4 Refering to the Exploded View drawing, insert the pivot dowels into the holes in the frame sides. Place the uprights on the pivot dowels, then glue the uprights into the base mortises.

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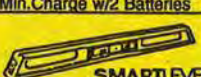

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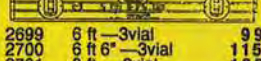

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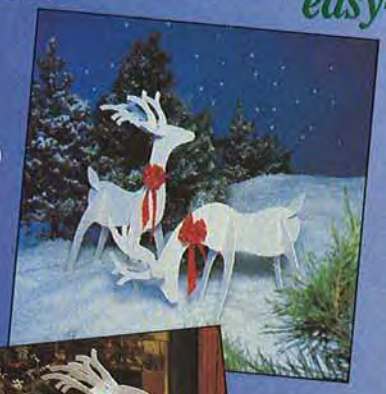
Santa
(4" Height)

NEW THIS SEASON!

Christmas Tree
(6' Height, 4'6" Diameter)

Holiday Cutouts Grace the Season

Decorate the season with these easy-to-build holiday cutouts.



Large
Reindeer
(3' W x 4' H)

Decorate your yard and home with these impressive holiday cutouts. Build them yourself for years of enjoyment, and a sense of pride and accomplishment. Full-size patterns and complete step-by-step instructions make each of these holiday decorations easy to build! Only a few tools and an evening or two are needed for each project. For professional results, just follow the simple cutting, painting and assembly instructions. It's as easy as that! Plus, when the season's over, disassemble and lay the pieces flat for space-saving storage. To assure your success, the experts at *WOOD*® magazine designed and built each project.

Med./Small
Reindeer
med. 28"
Height, sm.
9" Height)

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Order your holiday project plans today by sending your name address and the name of the plan(s) you wish to receive, plus a check or money order (U.S.) for the total amount to: WOOD MAGAZINE PLANS, P.O. Box 9255, Dept. WD-36, Des Moines, Iowa 50306.

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Sleigh
(56" L x 35" H)

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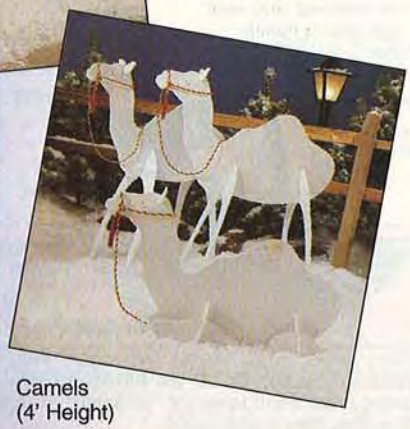
Wise Men
(50 1/2" Height)

Angels (4' Height)

Nativity Scene
(Mary 32 1/2" H, Joseph 45 1/2" H)

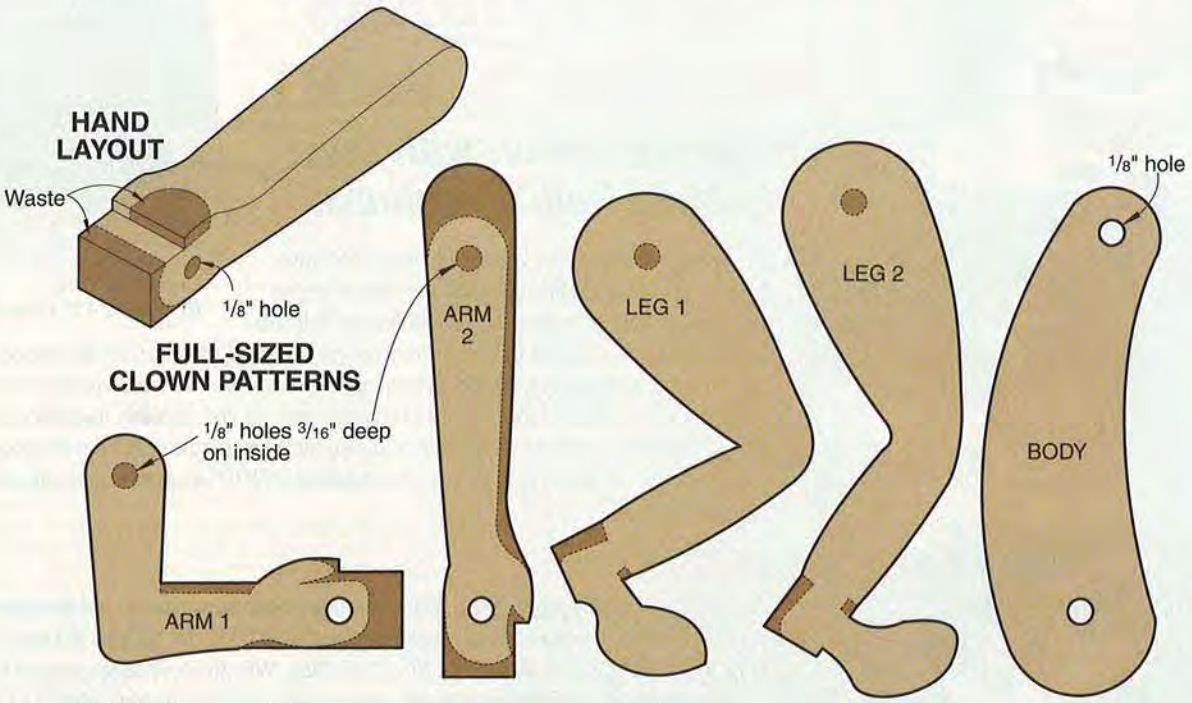


Camels
(4' Height)

100% money-back guarantee if not completely satisfied.

CLOWNING AROUND

Continued from page 61 *See related article on page 58.*



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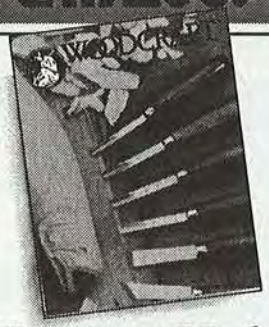

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Continued from page 67

A ladder made to reach the top bunk

1 Cut the ladder sides (R) to shape, using the Ladder Side View drawing for reference.

2 Mark the dado and slot locations on both rails. Cut the slots to shape. Note that the pieces are mirror images of each other; be careful not to make two left-hand or two right-hand ladder sides.

3 Transfer the full-sized ladder catch outline to ¾" stock, and cut the catches (T) to shape. Glue them to the top of the ladder sides (R) where shown on the Ladder Side View drawing.

4 Rout ⅛" and ¼" round-overs along all edges (including the hand-hold slots), where shown on the Ladder drawing.

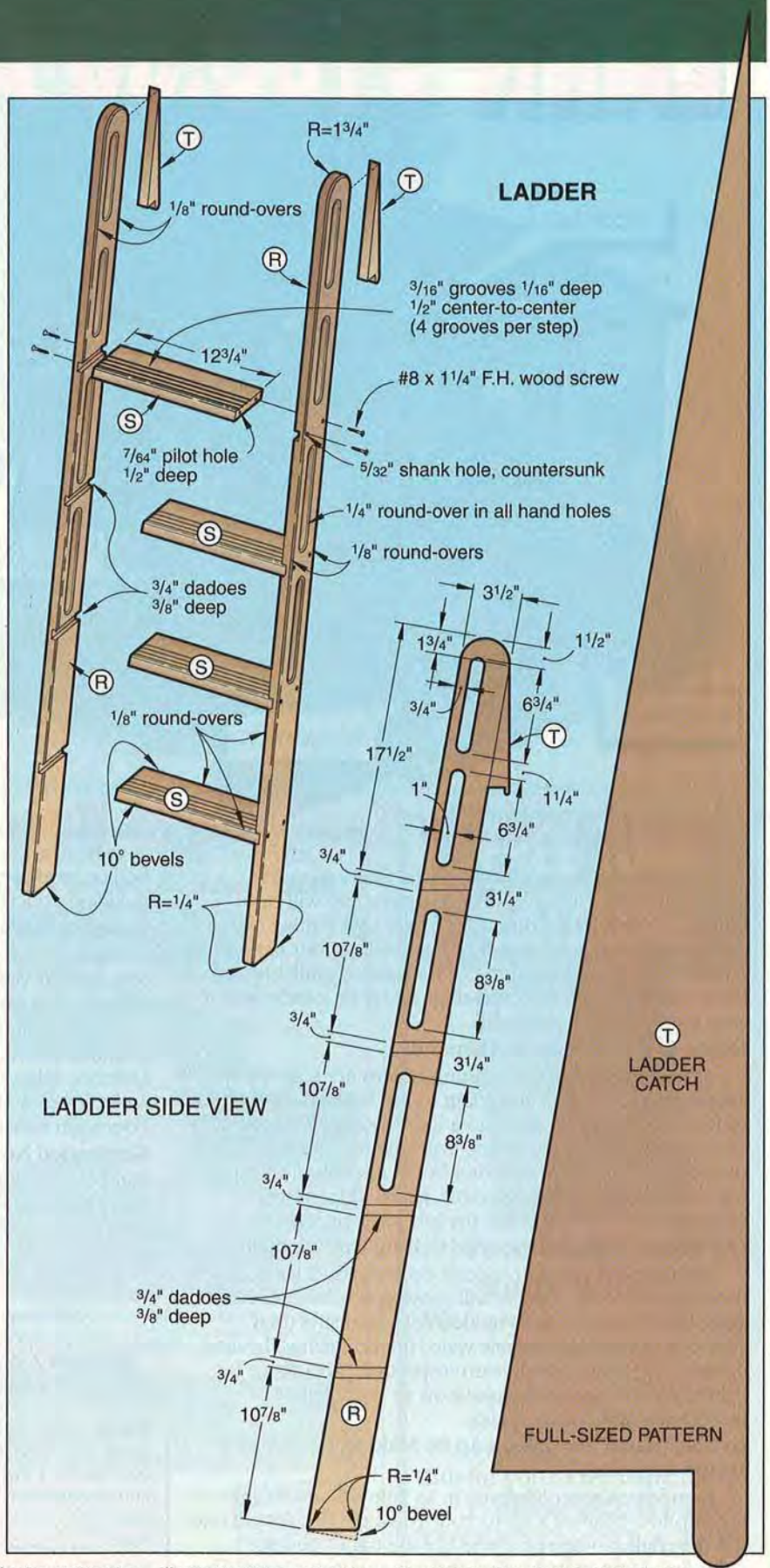
5 Using your tablesaw fitted with a dado blade and a long wooden extension attached to your miter gauge, cut four dadoes at a 10° angle in each side piece where marked. Mark screw-hole centerpoints on the outside face of the sides, centered over the dadoes.

6 Cut the steps (S) to size, bevel-ripping the front and rear edges at 10°. Using a 3/16" veining bit, rout a set of grooves in each step where shown on the Ladder drawing. Glue and screw the steps in place. Sand a ⅛" round-over along all edges of the steps.

Finishing and final assembly

1 Finish-sand the beds, side and headboard safety rails, and ladder. Apply a stain if desired (we left ours natural). Apply the finish, lightly sanding between coats with 320-grit sandpaper.

2 Reassemble the beds in the bedroom, screwing the plywood bottoms (K) to the top of the cleats (J). If used as bunk beds, use the holes in the safety rail supports (Q) as guides to drill mating holes in the top bunk bed rail (I). Screw the sides and head safety rails in place.



Written by Marlen Kemmet Project Design: Dave Ashe; James Downing Illustrations Roxanne LeMoine Photographs:King Au; John Hetherington

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Model	Description	List	Sale
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23-680	6" Bench Grinder 1/4 HP	86	75
11-950	8" Drill Press	199	128
31-050	1" Belt sander 2.0 amp	104	75
31-460	4" Belt/Disc Sander	198	129
40-560	16" 2 speed Scroll Saw	266	178
11-990	12" Bench Drill Press	276	184
11-090	32" Radial Bench Drill Press	399	305
43-505	1/2" Bench Router/Shaper	399	289
22-540	12" Bench Top Planer	Sale	385
	FREE Set of extra knives included !		
36-220	10" Compound Mitre Saw	350	215
28-180	Bench Band Saw	232	158
28-190	NEW 12" Band Saw	465	395
40-640	20" Bench Scroll Saw	466	295
37-070	NEW 6" v/spd Bench Jointer	337	258
14-650	Hollow Chisel Mortiser	668	289
46-700	12" Wood Lathe	548	449
33-990	10" Radial Arm Saw	818	695
37-280	6" Motorized Jointer	488	389
50-179	3/4 HP 2 stage Dust Collector	483	358
33-055	8-1/4" Sawbuck comp w/legs	865	625
36-040	8-1/4" Compound Mitre Saw	224	149
36-905	30" Unifence	385	249
34-897	50" Delta Unifence	525	299
36-755	10" Tilting Arbor Saw	1264	1039
17-900	16-1/2" Floor Drill Press	462	399
33-060	"Sidekick" Miter Saw	510	389
37-190	6" Deluxe Jointer	554	479
36-275	8-1/4" Builders Saw	444	265
36-210	10" Compound Mitre Saw	438	255
36-070	10" Mitre Saw	284	165
36-630	10" Contractors Saw II	700	579
34-555	Sliding Table	459	329
22-661	13" Planer w/ stand 2 HP	1513	1239
37-154	6" Jointer w/ mobile base	1451	1239
34-444	Contractors Table Saw	812	645
34-445	34-444 Saw w/30" Unifence	1200	829
	above saw comes w/ mobile base		
28-283	14" Band Saw w/enc. stand	910	779
	above saw comes w/ mobile base & fence		
36-250	NEW 10" Slide Compound Saw	825	489

MILWAUKEE TOOLS

6527	NEW Sawzall with case	320	172
6528	above Sawzall w/wired cord	316	172
0407-1	12V Drill w/kyls chuck & 2 batt	172	
0406-1	9.6V Drill Kit with 2 batteries	332	159
0231-1	3/8" Drill 0-1700 rpm	148	95
0224-1	3/8" Drill 4.5 amp magnum	227	128
0234-1	1/2" Drill 4.5A mag 0-850 rpm	237	132
0244-1	1/2" Drill 4.5A mag 0-600 rpm	237	132
0222-1	3/8" Drill 3.5 amp 0-1000 rpm	198	115
0228-1	3/8" Drill 3.5 amp 0-1000 rpm	195	112
0375-1	3/8" close quarter Drill	237	139
0379-1	1/2" close quarter Drill	268	158
6546-1	cdls Scrwdvr 200 & 400 rpm	141	84
6547-1	6546-1 w/bits, 1/4" chuck, & cse	176	105
5399	1/2" D-hdle Hammer Drill Kit	332	194
6507	Original SawZall with case	264	144
5397-1	3.8" var. spd Hammer Drill Kit	255	142
5371-1	1/2" var. spd Hammer Drill Kit	340	188
3107-1	1/2" v/spd right angle Drill Kit	399	219
6754-1	Drywall Gun 0-4000 5.4 amp	196	114
3300-1	1/2" var. spd right angle Drill	356	199
5680	Router 2 HP w/ 1/4" & 1/2" collets	362	165
0235-1	1/2" Drill w/keyless chuck	237	138
6142	4-1/2" Grinder w/cse & access.	208	124
6749-1	Drywall Gun 0-2500 5.4 amp	218	128
6365	7-1/4" Circular Saw 13 amp	218	122
6366	6365 w/fence & carbide blade	228	129
6368	6365 w/fence,carb. blde,& cse	249	139
6377	7-1/4" Worm Drive Saw	330	189
6256	Top Handle Jig Saw	264	152
6490	10" Mitre Saw	444	248
6491	6490 w/ carbide blade & bag	532	319
6494	NEW 10" Compound Mitre Saw	444	315
0422-1	NEW 12V Hammer Drill w/2 batt	430	249
0431-1	NEW 12V Drill w/ 2 batteries	385	229

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LU82M010	Cut-off 10"	60	93	45
LU84M011	Comb 10"	50	76	42
LU85M010	Super Cut-off	10" 80	115	59
LM72M010	Ripping 10"	24	69	38
LU73M010	Cut off 10"	60	84	45
LU87M010	Thin Kerf 10"	24	72	39
LU88M010	Thin Kerf 10"	60	88	45
LU98M010	Ultimate 10"	80	128	68
LU91M010	Compnd Mitre 10"	60	88	54
F410	NEW Quiet Blade 10"	40	95	49
F810	NEW Quiet Blade 10"	80	135	74
TK303	7-1/4" Finishing	40	38	22
TK906	10" Combo	50	53	32
SD308	8" Dado - Carbide		230	119
SD506	6" carbide w/case & shims		292	155
SD508	8" carbide w/case & shims		344	168
F10	2-1/8" x 3/4" Biscuit 1000 Qty		43	29
F20	2-3/4" x 1" Biscuit 1000 Qty		45	29
FA	Assorted Biscuits 1000 Qty		45	29
FB100	16 piece Forstner Bit Set		338	189
94-100	5 pc. Router Bit Door System		320	159
TR215	10" Slide Cmpd Mitre Saw		688	369
FT2000E	3-1/4 HP v/sp Plunge Router		410	205
JS100	Biscuit Jointer		334	164

MAKITA TOOLS

Model	Description	List	Sale
6070DW	3/8" v/spd Reverse Drill 7.2V	128	64
6172DWE	3/8" w/spd Drill Kit w/ 2 batt	220	109
5090DW	3-3/8" Saw Kit 9.6 volt	270	145
ML900	Incandescent Flashlight 9.6V	Sale	37
DA391DW	3/8" angle Drill Kit 9.6 volt	312	179
6012HDWE	2 speed Drill Kit w/2 batt.	243	135
6093DWE	6093DW Drill Kit w/2 batteries	270	139
6095DWE	6095DW Drill Kit w/2 batteries	270	139
6095D	6095DW Drill only & case	Special	79
632007-4	9.6 volt Battery	47	30
632002-4	7.2 volt Battery	39	28
	NEW CORDLESS DRILLS WITH HIGH CAPACITY BATTERIES		
6202DWG	9.6V 3/8" Drill Kit w/ LED batt	390	219
6212DWG	12V 3/8" Drill Kit w/ LED batt	412	228
6312DWG	12V 1/2" Drill Kit w/ LED batt	432	239
6201DWHE	9.6V 3/8" Drill Kit w/ 2 batt	351	185
6211DWHE	12V 3/8" Drill Kit w/ 2 batt	368	195
6311DWHE	12V 1/2" Drill Kit w/ 2 batt	399	205
5007NBA	7-1/4" Saw w/electric brake	263	135
9900B	3" x 21" Belt Sander w/bag	344	175
9924DB	3" x 24" Belt Sander w/bag	329	164
4301BV	Orb. var. spd Jig Saw 3.5A	292	155
JR3000V	var. speed Recip Saw w/case	252	139
9820-2	Blade Sharpener	394	215
N1900B	3-1/4" Planer with case	244	129
N9514B	4" Disc Grinder 4.6 amp	111	65
B04552	1/4 sheet Pad Sander w/bag	98	55
DA3000R	3/8" Angle Drill	314	179
2708W	8-1/4" Table Saw	585	305
2711	10" Table Saw with brake	1067	589
6405	3/8" Drill Rev. 0-2100 rpm	112	68
6510LVR	3/8" Drill Rev. 0-1050 rpm	168	98
6013BR	1/2" Drill Rev. 6 amp	280	149
9401	4" x 24" Belt Sander w/bag	378	229
4303C	var. speed Orbital Jig Saw	351	205
5077B	7-1/4" Hypoid Saw	281	155
5007NB	7-1/4" Circular Saw 13 amp	232	124
5007NBK	5007NB Saw w/ plastic case	Sale	129
LS1011	10" Slide Compound Saw	946	525
LS1211	New 12" Slide Cmpd Saw	1550	795
3901	New Plate Joiner Kit	372	219

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SN325	Nailer 1-7/8" - 3-1/4"	665	419
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SKS	Stapler 5/8" - 1-1/2"	390	275
SN70	Fram. Nailer Clip Hd 2"-3-1/2"	690	479
SN60	Fram. Nailer-Full Hd 2"-3-1/2"	638	449
SFN40	NEW Finish Nailer 1-1/4 - 2-1/2	571	389

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BT35-2K	BT35-2 w/ case, oil, & brads	299	169
CWC100	1 HP Pancake Compressor	463	289
MIIIFS	Flooring Stapler 15 gauge	931	529
S32SX-1	Finish Stapler - 1/2" - 1-3/8"	275	159
S32SX-1KS	S32SX-2 with case & oil	269	169
PC5000-1	NEW Power Crown Stapler	300	159

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2735-04	12 volt cordless Drill Kit	249	144
2736-04	2735-04 with keyless chuck	269	148
1605-02	Biscuit Joiner w/case	221	135
3400	10" Table Saw - Bench Top	270	189
77	Famous 7-1/4" Worm Drive Saw	Sale	144
77M	NEW 77 Mag Worm Saw - 2 lbs lighter than Model 77	Sale	159

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EY6205EQK	Same as EY6205BC but comes with **Ironman** battery	368	192
EY6207BC	NEW 12 volt 1/2" Drill w/keyless chuck var. speed w/15 min. charger & case	420	222
EY6282EQK	Var. spd 9.6 volt Drill with 15 min. charger, case & NEW **Ironman** battery	315	169
EY62821DKW	9.6 volt Drill Kit w/2 batt.	395	162

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EY6100CRKW	NEW 12 volt Drill Kit with 2 batteries, 1 hour charger, & case	358	188
EY6100CQKW	Same as EY6100CRKW but has 15 minute charger	420	198
EY6100EQK	NEW 12 volt Drill kit with NEW **Ironman** battery, 15 min. charger, & cse	375	199
EY6100EQKW	Same as EY6100EQK but w/2 **Ironman** batteries	473	209

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List 386 Sale 205

DELTA #34-060 10" MITRE BOX XTRA SPECIAL 194.00

DEWALT TOOLS

Model	Description	List	Sale
DW364	7-1/4" Circ. Saw w/brake	285	158
DW945K-2	12V cdls Drill Kit w/2 batt	309	179
DW944K-2	9.6V cdls Drill Kit w/2 batt	283	165
DW610	1-1/2 HP 2 handle Router	274	149
DW411	1/4 sheet Palm Sander	97	58
DW100	3/8" Drill, 4 amp,0-2500 rpm	118	68
DW682K	**Biscuit Joiner with case**	429	219
DW705	12" Compound Mitre Saw	706	359
DW625	3 HP var. spd PlungeRouter	Sale	275
	DW625 Router comes with FREE DW6966 Fine Depth Adjuster!		
DW930K	NEW 12V 5-3/8" Trim Saw Kit	370	199
DW935K	NEW 14.4V 5-3/8" Trim Saw Kit	444	237
	DW935K comes with FREE DW9091 battery!		
DW675K	3-1/8" Planer with case	289	164
DW431	3 x 21 v/spd Belt Sander	331	184
DW421	5" Palm Random Orbit Sander	125	79
DW444	6" Ran Orb Sander-PSA pad	266	139
DW443	DW444 w/hook & loop pad	266	139
DW673K	NEW Laminate Trimmer Kit	364	215
	DEWALT CORDLESS DRILLS		
DW952K	3/8" v/spd w/two 9.6V batt	280	145
DW953K	3/8" v/spd w/one 12V batt	306	175
DW962K-2	3/8"v/sp w/two 9.6V XR batt.	324	179
DW972K-2	3/8"v/sp w/two 12V XR batt.	352	169
	above drill comes with FREE bit set!		
DW991K	3/8"v/sp w/one 14.4V XRbatt	370	199
DW991K-2	above drill w/ 2 batteries	Sale	225
	Above drill kits come w/ charger & steel case!		

HITACHI TOOLS

C8FB	8-1/2" Slide Compound Saw	1400	575
C10FS	10" Slide Compound Saw	1595	745
P12R	12-9/32" Planer	1470	815
P12RA	Planer/Joiner	1940	1015
G12SA	4-1/2" Grinder 6.9 amp	160	89
NR83A	Fram Nailer 2 - 3-1/2 Full Head	700	409
NR83AA	Framing Nailer 2 - 3-1/2	750	425
NT65A	16 ga. Brad Nailer 1 - 2-1/2	610	339
NV45AB	Coil Roofing Nailer 7/8 - 1-3/4	750	435

BIESEMEYER FENCES

B-50	50" Commer. Saw Fence	345	298
T-SQUARE 52	52" Homeshop Fence	279	238
T-SQUARE 40	40" Homeshop Fence	259	208
T-SQUARE 28	28" Homeshop Fence	249	198

JORGENSEN ADJUSTABLE HANDSCREWS

Item#	Jaw Length	Open Cap	List	Sale	Box of 6
#0	8"	4-1/2"	19.76	11.75	58.00
#1	10"	6"	22.63	12.50	68.00
#2	12"	8-1/2"	25.95	14.50	78.00

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	3/4" Black Pipe Clamps	14.87	7.80	88.95
52	1/2" Black Pipe Clamps	12.40	6.70	71.50

BOSCH

Model	Description	List	Sale
1587VS	NEW Top Hand "CLIC" Jig Saw	292	149
1584VS	NEW Barrel "CLIC" Jig Saw	285	149
	Bosch Metal Case for above Jig Saws	34	32
	Bosch 30 blade assortment for Jig Saws		28.99
	1584VS or 1587VS with steel case and 30 Bosch blades	Sale	189
1272D	3" x 24" Belt Sander with bag.	375	209
1273D	4" x 24" Belt Sander with bag.	380	215
11212VSR	Bulldog 3/4"SDS Rtry Drill	390	209
1347AK	4-1/2" Grinder w/cs & access.	185	109
1194VSR	1/2" var. speed Hammer Drill	282	155
1194VSRK	above Hammer Drill w/case.	313	169
1609K	Lam Installers Kit with 1609	343	189
1609KX	Deluxe Installers kit	405	234
1604A	1-3/4 HP 2 Handle Router	250	142
1604AK	same as above w/cse & acc.	318	185
1606A	1-3/4 HP D-handle Router	295	184
3270DVS	3 x 21v/spd belt sander w/ bag	270	165
1273DVS	var. spd 4" x 24" Belt Sander	415	228
1614EVS	1-1/4HP v/spd Plge Router	283	159
1613EVS	2HP v/sp Plunge Router	359	199
1615EVS	3 HP v/spd Plge Router	505	289
1632VSR	Recip Saw 8.4A orb-v/spd	225	159
3050VSRK	9.6V cdls v/sp Drill Kit comp	288	149
3051VSRK	3050VSRK w/keyless chuck	299	149
3054VSRK	12V Drill Kit w/ 2 batteries	330	185
3300K	NEW 12V Drill Kit w/ 2 batt	348	199
3310K	NEW 12V T-handle Drill Kit	348	199
3110K	NEW 9.6V T-handle Drill Kit	320	185
3283DVS	5" Random Orbit Sander	169	98
3283DVSK	3283DVS Kit complete	199	118
3725DVS	NEW 5" Random Orbit Sander	258	149
3727DVS	NEW 6" Random Orbit Sander	268	154
B1650K	NEW Biscuit Joiner	289	155
B7000	NEW Corner Detail Sander	122	68
B7001	B7000 w/ variable speed	156	95
B4050	NEW In Line Jig Saw	199	115
11230EVSN	NEW SDS-max 1-1/2" Rtry Hmr	885	525
11231EVSN	NEW SDS-max 1-3/4" Rotary Hammer	1336	809
11223EVSN	NEW SDS-max 2" Rotary Hmr	1548	929

AEG POWER TOOLS

Model	Description	List	Sale
TXE150	6" var/spd Ran Orb Sander	304	139
HBSE75S	3"x21" var/spd Belt Sander	309	179
BSPE100X	Top Handle Jig Saw w/case	286	162
FSPE100X	Barrel Grip Jig Saw w/case	274	162

PORTA NAILER

401	Porta Nailer complete	265	205
501	Face Nailer complete	265	205

BLACK & DECKER

2694	7-1/4" Super Sawcat w/case	285	158
2695	8-1/4" Super Sawscat w/case	328	175

DAVID WHITE

LP6-20	Sight Level package - 20x	310	205
LP6-20XL	LP6-20 w/9056 tripod & 7620 rod		265
LT8-300	Level Transit - 26x	695	439
LT8-300P	above Level w/optical plum	821	518
LT6-900	Level Transit - 20x	389	254
ALT6-900A	Automatic Level - Transit -18x	638	395
ALTP6-900	above Level w/tripod & rod	708	495
ALP6-18HD	above Level w/tripod & rod	570	385
ML100□	NEW Laser Level	1099	945
ML100	NEW Laser Level w/detector	1249	1075

RYOBI SPECIALS

RE600	3 HP Plunge Router	500	228
BE321	3" x 21" var. spd Belt Sander	310	148
TFD222VRK	12V cordless Drill Kit	365	149
BT3000	10" Table Saw with stand	1125	529
AP12	12" Bench Planer	884	395
BS900	9" Bench Band Saw	340	165
OSS450	Oscillating Spindle Sander	340	159
DC500	NEW Detail Carver	120	64
TSS200	NEW 8-1/2" Slide Comp. Saw	895	399

SIOUX TOOLS

8030	New 3/8" var/spd Drill	250	145
8000	3/8" var/spd close qtr Drill	201	125
690	5" Air Random Orbit Sander	130	132
Msx636 FEIN	Triangle Sander Kit	Sale	199
Msx625 FEIN	New Air Triangle Sander	Sale	189
Lamello	New Cordless Biscuit Joiner	695	549
LPN672 PONY	Air Palm Nailer w/glove	Sale	94.99
RTM01 ROTOZIP	Drywall cut out unit		68.95

QUAL-CRAFT PRODUCTS

2200	Pump Jack	79	58
2201	Pump Jack Brace	30	20
2203	Pump Jack guard rail holder	31	21
2204	Workbench & rail holder combo	53	39
	Buy any 6 (can be assort.) deduct 10%		
2601	Wall Jack	167	108
	Lots of 4 deduct additional 10%		

PORTER CABLE

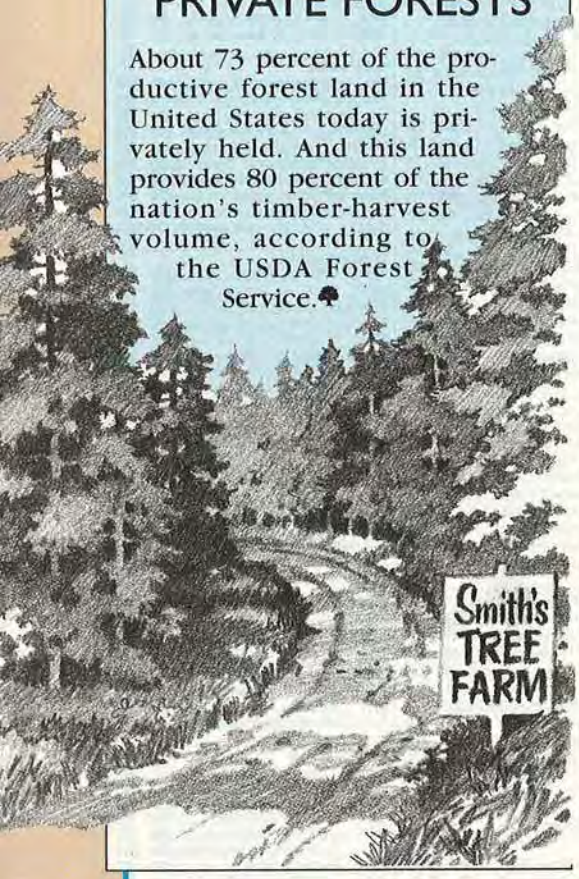
444	Profile Sander	157	94
9444	Profile Sander Kit	205	119
7499	Ultimate Cut-out tool	113	69
690	1-1/2 HP Router 8 amp	260	138
691	1-1/2 HP Router D-handle	285	155
693	1-1/2 HP Plunge Router Base	320	174
6931	Plunge Router Base	125	77
695	1-1/2 HP Router/Shaper	400	223
696	Heavy Duty Shaper Table	230	129
351	3" x 21" Belt Sander w/o bag	280	158
352	3" x 21" Belt Sander with bag	290	165
352VS	3x21 Belt Sander w/bag w/spd	305	169
360	3" x 24" Belt Sander with bag	365	198
361	3" x 24" Belt Sander w/o bag	345	194
362	4" x 24" Belt Sander with bag	380	208
97751	1/2" v/spd Hammer Drill w/cse	270	155
9118	Porta Plane Kit 7 amp	390	218
505	1/2 sheet Pad Sander	230	128
7549	Top handle Jig Saw 4.8 amp	270	135
330	Speed Block Sander 1/4 sheet	110	62
556	Biscuit joiner w/5556 tilt fence	Sale	139
345	6" Saw Boss 9 amp	190	104
9345	345 comp. w/cse & carb blde	220	128
9647	TIGER CUB Recip. Saw	210	119
9637	Full var/spd Recip Saw 8 amp	270	148
7519	3-1/4 HP Router 2 Handle	445	239
7518	3-1/4 HP 5 speed Router	510	275
7538	3-1/4 HP Plunge Router	445	239
7399	5.6 amp Drywall Cutout Unit	140	84
7310	5.6 amp Laminate Trimmer	165	95
97310	Laminate Trimmer Kit comp	360	198
7335	5" Rndm Orbit Sndr w/ case	245	132
97355	7335 w/ case & dust pick-up	274	145
7336	6" Rndm Orbit Sander w/ case	250	137
97356	7336 w/ case & dust pick-up	284	149
73333	Dust Collection system	31	24.50
7539	3-1/4HP v/spd Plunge Router	510	275
9853	12V 3/8" Drill w/ keyless chuck	280	154
9855	12V 1/2" 2 spd,v/sp Drill w/cs	335	178
8500	12V battery for above drills	Sale	45
332	Palm Grip Rndm Orbit Sander	120	69
333	above Sander with dust bag	135	75
334	333 Sander with PSA pad	135	74
340	1/4 Sheet Orb Sndr w/dust p/u	89	55
550	Pocket cutter with case	330	179
7700	10" "Lazerloc" Mitre Saw	634	345
310	Production Laminate Trimmer	250	145
347	7-1/4" "Framers" Circ Saw	225	129
347K	347 Saw w/ plastic case	250	134
743	347 Saw - left hand version	225	129
743K	743 Saw w/ plastic case	250	134
9743	743 Saw with case	255	139
447	347 Saw with brake	225	134
843	447 Saw-left hand version	245	139
7800	Drywall Sander	585	329
7810	Wet/Dry Vac for above sander	455	259
9637	New Tiger Recipro Saw	290	165

FREE FREIGHT TO THE CONTINENTAL STATES ON EVERY ITEM • GIFT CERTIFICATES NOW AVAILABLE

FINISHING TOUCHES

PRODUCTIVE PRIVATE FORESTS

About 73 percent of the productive forest land in the United States today is privately held. And this land provides 80 percent of the nation's timber-harvest volume, according to the USDA Forest Service.



A CENTURY OF POWER TOOLS

The world's first electric power tool, the Fein Electric Hand Drill, 1895.

Today's woodworkers take power tools for granted. There seems to be one for every task. Up until 100 years ago, though, there were no electric-powered tools.

Then, the world's first electric power tool, a hand drill, was invented by two mechanics of Wilhelm Emil Fein at the C.& E. Fein factory in Stuttgart, Germany, in 1895. It weighed 16½ pounds and drilled a 5/32" hole. Later Fein innovations and improvements included the flexible drill shaft (1898), a hand drill with aluminum components (1900), three-speed drill (1903), and power tools with universal AC/DC motors (1912).

BUILD A TOY FOR TOTS, TOO

Why not add some needy children to your gift list? You have nearly a year to do it. That's right, *WOOD*® magazine's 1996 Build-A-Toy® Contest (see *page 36*) has a new deadline. Rather than the traditional February 1, we've rolled it ahead to September 1, 1996. As usual, though, toy entries that you build will be sold at auction to benefit the Marine Corps Reserve's Toys for Tots program in time for next year's Christmas season. That way, your toy entry will bring happiness to a child or two or even three. And, you might even win one of the great prizes.

SO YOU THINK YOU'VE GOT TROUBLE!

***Above left*. It took Herb's dad, uncles, and a friend with a crane a whole day to raise the new shop's roof trusses.**

***Left*. In no time the following day, a tornado wiped out all of the previous day's (plus many weeks') work .**

It was June 12, 1993, and Herb Bynum of Gadsden, Alabama, was heading to work. But he couldn't help stopping to admire the roof trusses that had gone up only yesterday atop the stud walls of his new two-story, 25×32' shop (see photo *left*).

Herb's joy suffered quite a blow a few hours later, though, when he was called to the phone. His wife was on the line to inform him that the tornado that just whipped through town had brought down the top of an oak tree and wiped out all the work that had gone into his shop-to-be!

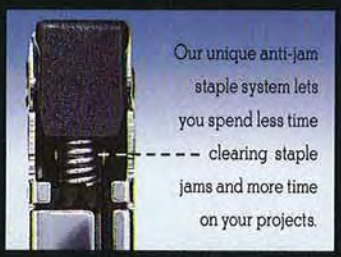
We found out about this incident when Herb responded to the article "More Home Workshops That Work" in the January 1995 issue of *WOOD* magazine. He told us the sad story and enclosed the photos—plus ones of the rebuilt shop. Yes, there is a happy ending. Herb had insurance that covered most of the damage, and he was able to salvage much of the framing lumber. Now, according to his letter, he's in full operation in his fledgling cabinet business that he has always dreamed about. So, all the best of luck, Herb. You really deserve it!

Photographs: Courtesy of Herb Bynum; Fein Power Tools
Illustrations: Jim Stevenson

You'll notice a difference the first time you squeeze the handle. Starting with the fact that you can actually squeeze the handle.

Our new Sharpshooter™ staple gun takes only 19 pounds of force to drive a staple flush. (That's a third less than our leading competitor.) It also has an anti-jam staple core. And a patented double-bumper

system that helps reduce recoil and hand fatigue. This intense



attention to detail sets Stanley apart from other tool companies. It's what led us to design a garage door able to withstand a hurricane and a tape rule that's Mylar*-coated for durability. And it's something we're quite confident you'll notice every time you pick up one of our products.

STANLEY
helps you do things right.®

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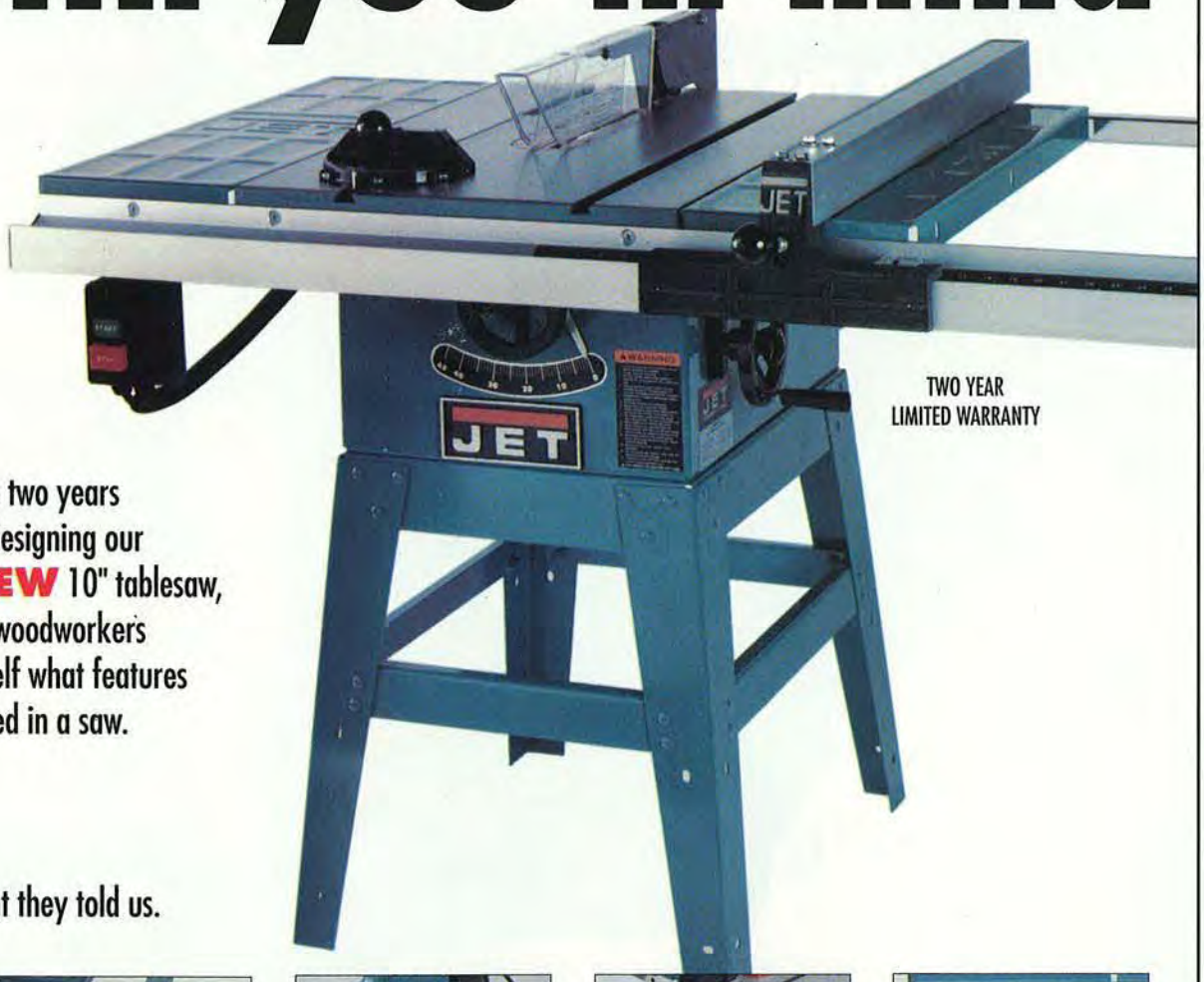
A tablesaw built with you in mind



TWO YEAR
LIMITED WARRANTY

During the two years we spent designing our totally **NEW** 10" tablesaw, we asked woodworkers like yourself what features they wanted in a saw.

This is what they told us.

Quick-release precision JETFENCE® allows smooth, accurate adjustments on either side of blade.

Dust hood with 4" outlet is built-in for easy hook-up to your collection system.

Totally enclosed, fan-cooled motor. Quick-connect plug requires no wiring; just plug in male and female connectors.

Heavy-duty push button switch positioned for convenience and safety.

JET
EQUIPMENT & TOOLS

For the name of the JET dealer nearest you, call 1-800-274-6848.

WOOD® MAGAZINE'S GUIDE TO WOODWORKING SCREWS

TRADITIONAL WOOD SCREWS
(Actual Sizes)

Gauge		2	3	4	5	6	7	8	9	10	12	14
Head-Bore Size		11/64"	13/64"	15/64"	1/4"	9/32"	5/16"	11/32"	23/64"	25/64"	7/16"	1/2"
Shank-Hole Size		3/32"	7/64"	7/64"	1/8"	9/64"	5/32"	5/32"	11/64"	3/16"	7/32"	1/4"
Pilot-Hole Size	**Hardwood**	1/16"	1/16"	5/64"	5/64"	3/32"	7/64"	7/64"	1/8"	1/8"	9/64"	5/32"
	Softwood	1/16"	1/16"	1/16"	1/16"	5/64"	3/32"	3/32"	7/64"	7/64"	1/8"	9/64"
Phillips-Head Point Size		#1			#2						#3	
Square-Drive Bit Size		#0		#1			#2				#3	

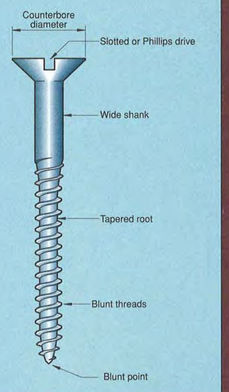
Available Lengths

1/4" 3/8" 1/2" 5/8" 3/4" 1" 1 1/8" 1 1/4" 1 3/8" 1 1/2" 1 5/8" 1 3/4" 2" 2 1/4" 2 1/2" 2 3/4" 3" 3 1/4" 3 1/2" 3 3/4" 4"

PRODUCTION SCREWS
(Actual Sizes)

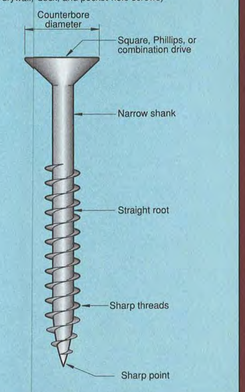
	4	6	8	10	12	14
	7/32"	17/64"	11/32"	23/64"	7/16"	1/2"
	See ANATOMY OF A PILOT HOLE *below*					
Hardwood	5/64"	7/64"	1/8"	9/64"	5/32"	3/16"
Softwood	1/16"	3/32"	7/64"	1/8"	9/64"	5/32"
	#1		#2		#3	
	#0	#1	#2		#3	

ANATOMY OF A WOOD SCREW



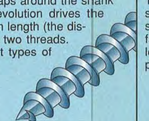
ANATOMY OF A PRODUCTION SCREW

(Includes drywall, deck, and pocket-hole screws)

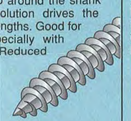


THREAD TYPES

SINGLE LEAD
One thread wraps around the shank so that one revolution drives the screw one pitch length (the distance between two threads. Found on most types of wood screws.

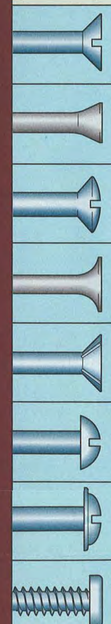


DOUBLE LEAD
Two threads wrap around the shank so that one revolution drives the screw two pitch lengths. Good for fast driving, especially with longer screws. Reduced pull-out strength.



WOODCUTTING
Small serrations on the threads saw into the wood as the screw is driven. Reduces the chances of splitting the wood and the need for pilot holes.

HEAD TYPES



FLAT
The most common screw head type. Used for general fastening. Requires a countersink in workpiece.

TRIM
Narrow-diameter head looks and acts like a finish nail. Eliminates the need for a countersink and counterbore.

OVAL
Head projects above surface of workpiece for a decorative effect. Also prevents rough edges that occur when a flathead screw doesn't countersink perfectly flush.

BUGLE
Tapered head snugs screw into the workpiece without requiring a countersink. Found on drywall and deck screws.

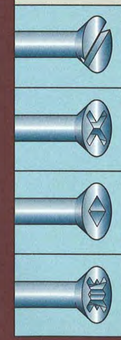
SELF-SINKING
Nibs on the underside of the head cut the wood to create a countersink as the screw is driven. Use when the head will sit flush with the workpiece.

ROUND
Flat bearing surface under head distributes load evenly when attaching metal to wood. Some decorative uses.

ROUND WASHER
Built-in washer under head distributes load over a wide area and helps hold soft, thin, or brittle material.

PAN/TRUSS
Large, flat head allows some latitude in positioning hardware such as hinges and drawer slides. Also found on pocket-hole screws.

DRIVE TYPES



SLOTTED
Found on many traditional and brass screws. Prone to slippage, which may cause the screwdriver to mar the surrounding wood.

PHILLIPS
Found on drywall, deck, production, and some brass screws. Self-centering design less likely to cause slippage, but head may strip when excess torque is applied.

SQUARE
Found on production screws, the square recess eliminates slippage and won't strip out the head. Tight fit enables the screw to cling to the driver.

COMBINATION
Found on some production screws. Designed to be driven with a square driver and removed with either a square or a Phillips driver.

TIP TYPES

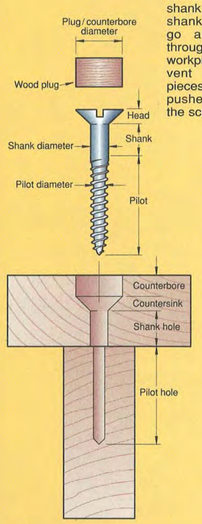
BLUNT POINT
Found on traditional wood screws. Requires a pilot hole for starting screw into wood.

SHARP POINT
Found on production, deck, and drywall screws. Prevents the tip from wandering when starting a screw without a pilot hole.

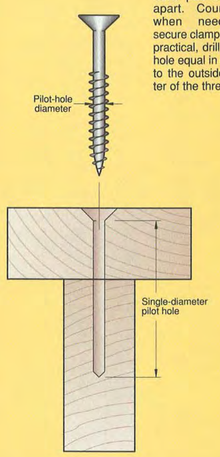
AUGER POINT
Found on pocket-hole and some production screws. Slot helps screw tap into wood and clear chips. Reduces the likelihood of wood splitting.

ANATOMY OF A PILOT HOLE

TRADITIONAL WOOD SCREWS
These require different diameters for the pilot and shank holes. The shank hole must go all the way through the upper workpiece to prevent the two pieces from being pushed apart by the screw threads.



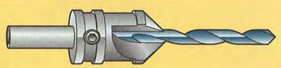
PRODUCTION SCREWS
In most cases these only need a single-diameter pilot hole drilled through both workpieces. Clamp the pieces tightly to prevent the screw from pushing them apart. Counterbore when needed. If secure clamping is not practical, drill a shank hole equal in diameter to the outside diameter of the threads.



PILOT-HOLE TOOLS

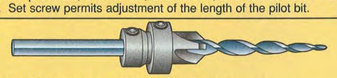
Each tool (except the countersink) comes in sizes that match the most common screw sizes, typically #4 through #12.

FLAT PILOT BIT
Drills the pilot hole, shank holes, countersink, and counterbore all in one step. Can leave a rough surface.

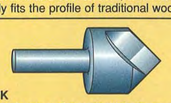


COUNTERSINK WITH PILOT BIT
Drills the pilot hole, countersink, and counterbore in one step. Set screw on the side permits adjustment of the length of the pilot bit.

COUNTERSINK WITH PILOT BIT AND NOSE PIECE
Drills the pilot hole, shank hole, countersink, and counterbore in one step. Set screw permits adjustment of the length of the pilot bit.

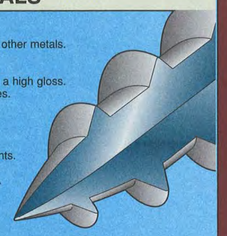


FULLER TAPERED PILOT BIT AND COUNTERSINK
Drills the countersink and counterbore, and makes a tapered pilot hole which accurately fits the profile of traditional wood screws.



COUNTERSINK
Drills the counterbore and countersink to create a proper fit for the underside of traditional and some production screws.

SOLID MATERIALS



Aluminum
Pros: Will not rust, lightweight.
Cons: Expensive, soft, will cause corrosion when in contact with other metals.
Uses: With aluminum hardware.

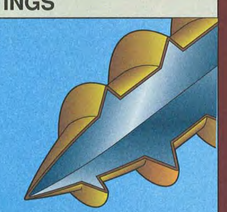
Brass
Pros: Resists corrosion, decorative appearance. Easily buffed to a high gloss.
Cons: Soft, easy to strip threads or head. Use oversize pilot holes. Moderately expensive.
Uses: To match brass hardware. In oak to prevent the staining caused by ferrous materials.

Silicon bronze
Pros: Excellent corrosion resistance in marine or wet environments. Helps prevent wood rot around screw holes.
Cons: Stronger than brass but less strong than steel. Expensive. Use oversize pilot holes.
Uses: Boats, decks, and structures exposed to salt spray.

Hardened Steel
Pros: Strong, low cost, wide availability.
Cons: Rusts when exposed to moisture or high humidity.
Uses: Indoors and anyplace the screw head will not show or be subjected to moisture.

Stainless steel
Pros: Strong, excellent corrosion resistance when exposed to salt water or spray, or woods with high tannin content.
Cons: Expensive.
Uses: Marine environments, decks, pressure-treated lumber, or projects with redwood or cedar.

SURFACE COATINGS



Black oxide
Pros: Low cost. Coating provides rust resistance during storage.
Cons: No long-term corrosion resistance.
Uses: Drywall, general construction, indoor applications only.

Bronze
Pros: Decorative, antique-brass appearance.
Cons: Limited corrosion resistance.
Uses: On antique hardware and darker woods where brass might appear too bright.

Zinc
Pros: Limited corrosion resistance, bright silvery appearance.
Cons: Less corrosion resistant than galvanized zinc.
Uses: With matching hardware or light colored woods. Indoor applications only.

Galvanized zinc
Pros: Good corrosion resistance, medium-priced alternative to stainless-steel screws.
Cons: Less durable than solid stainless steel.
Uses: Projects using redwood, cedar, or pressure-treated lumber.

CHOOSING AND USING THE RIGHT SCREW

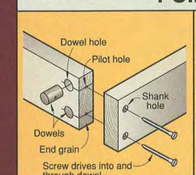
TRADITIONAL
The shape and design of the traditional wood screw has changed little over time. Some new versions use a Phillips drive. Although they require you to drill separate pilot and shank holes, many woodworkers still use the traditional screws in antique or reproduction pieces that call for matching hardware.

PRODUCTION
Originally designed for use in furniture factories and cabinet shops, these screws work well in solid wood and also provide excellent holding power in plywood, particle board, and medium-density fiberboard. The sharp threads help to prevent the wood from splitting, and the hardened steel shanks reduce breakage.

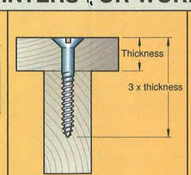
DRYWALL, DECK
These resemble production screws except for their bugle heads. Drywall screws have a black-oxide coating and often employ a double-lead thread. Deck screws come with a variety of anti-corrosion coatings. Drywall screws lack the strength of production screws. Both types also come with a smooth (unthreaded) upper shank.

POCKET HOLE
Combining a pan-style head with an auger-point tip on a production-style screw shaft yields a pocket-hole screw. The auger point helps prevent wood splitting when driving these screws into end grain. The flat bottom of the pan head helps to clamp the workpieces together by seating the screw tightly in the pocket hole.

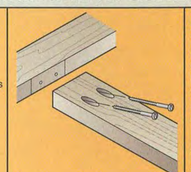
POINTERS FOR WORKING WITH SCREWS



ANCHORING WOOD SCREWS IN END GRAIN
To enable screws to get a better grip in end grain, bore the lower workpiece perpendicular to the pilot holes as shown, and glue dowels into these holes. The long grain on the dowel sections will hold the screw threads and resist pull-out better than the end-grain fibers.



CHOOSING THE RIGHT SCREW LENGTH
A screw should measure three times as long as the thickness of the the top workpiece. Keep in mind that end grain has less holding power, so add 40 percent to the screw length when driving screws into the end of a board (or use the technique shown *left*.)



JOIN RAILS TO STILES WITH POCKET-HOLE SCREWS
In situations where conventional screws are not long enough to penetrate both workpieces, make a pocket-hole joint. With a pocket-hole jig, drill two 15° pocket holes through one workpiece. Then, drive pocket-hole screws into the holes and adjoining workpiece.

STEEL BEFORE BRASS
To prevent damage to soft brass screw threads, drive the same-size steel screw into the pilot hole first. Then, back out the steel screw and drive the brass screw into the hole made by the steel screw.

NO SOAP, JUST WAX
When used as a lubricant for screws, soap will corrode metals and stain wood. Don't use it. Instead, dab the end of your screws in paraffin wax. This will give you a stain-and corrosion-free lubricant.

GAUGING UNKNOWN SIZES
To drill a pilot hole for an unknown size of screw, choose a drill bit that matches the diameter of the root of the screw in question.

CATALOG SOURCES

Grizzly Imports
P.O. Box 2069
Bellingham, WA 98227
800/541-5537

Leichtung Workshops
23297 Commerce Park
Beachwood, OH 44122
800/321-6840

McFeely's Square Drive Screws
1620 Wythe Rd.
P.O. Box 11169
Lynchburg, VA 24506
800/443-7937

Trend-Lines, Inc.
135 American Legion Hwy.
Revere, MA 02151
800/767-9999

Woodworker's Supply, Inc.
1108 N. Glenn Rd.
Casper, WY 82601
800/645-9292

Woodcraft Supply Corp.
P.O. Box 1686
Parkersburg, WV 26102-1686
800/225-1153

MANUFACTURERS/ DISTRIBUTORS

Bruss Fasteners
P.O. Box 88307
Grand Rapids, MI 03070
800/536-0009

Cully Enterprises Inc.
750 N. North Lake Way
Seattle, WA 98103
206/547-4035

Deerwood Fasteners
11136 Sam Furr Rd.
P.O. Box 1505
Huntersville, NC 28078
800/438-5146

Elco Consumer Products Corp.
5910 Falcon Rd.
Rockford, IL 61125-7033
815/229-0707

Häfele America
3901 Cheyenne Dr.
Archdale, NC 27263
800/334-1873

Pan American Screw Co.
2125 Industrial Parkway
Elkhart, IN 46516
800/236-1756

COUNTERSINK SOURCES

Credo Co.
2765 National Way
Woodburn, OR 97071
503/982-0100

Insty-Bit, Inc.
2310 Chesnut Ave. West
Minneapolis, MN 55405
612/381-1060

W.L. Fuller, Inc.
P.O. Box 8767
Warwick, RI 02888-0767
401/467-2900

MLCS Ltd.
P.O. Box 4053
Rydal, PA 19046
800/533-9298

Penn State Industries
2850 Comley Rd
Philadelphia, PA 19154
215/676-7606

Sears
(at stores nationwide)

Vermont American Tool Co.
P.O. Box 340
Lincolnton, NC 28093-0340
704/735-7464

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